

ARK-3381

Embedded Box Computer

User Manual

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Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from Advantech. Please contact your local supplier for ordering information.

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Technical Support and Assistance

- Step 1. Visit the Advantech web site at www.advantech.com/support where you can find the latest information about the product.
- Step 2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

ARK-3381 Series Model

There are two sub-models in ARK-3381 series listed below:

ARK-3381-2S0A2E:

ULV Celeron® M 1 GHz Embedded Box Computer, with VGA, LVDS, Fast Ethernet, 2 x RS-232, 5 x RS-232/422/485, 2 x Parallel

ARK-3381-2S4A2E:

LV Pentium® M 1.4 GHz, Embedded Box Computer, with VGA, LVDS, Fast Ethernet, 2 x RS-232, 5 x RS-232/422/485, 2 x Parallel

Packing List

Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact your dealer immediately.

- Warranty card
- 1 x ARK-3381 Unit
- 1 x DIN-Rail Mounting Kit (P/N:1997001110, 1997001120, 1997001130, 1997001140)
- 1 x PS2 Keyboard/Mouse Cable (P/N: 1700060202)
- 1 x Utility CD
- 1 x Flat Cable support RS-485/RS-422 mode for COM2 serial port (P/N: 1700001967)
- 1 x 2-P Phoenix to DC-Jack power cable
- (P/N: 1700001394)

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
 - a. The power cord or plug is damaged.
 - b. Liquid has penetrated into the equipment.
 - c. The equipment has been exposed to moisture.
 - d. The equipment does not work well, or you cannot get it to work according to the user's manual.
 - e. The equipment has been dropped and damaged.
 - f. The equipment has obvious signs of breakage.
15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -

20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.

16. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Wichtige Sicherheishinweise

1. Bitte lesen sie Sich diese Hinweise sorgfältig durch.
2. Heben Sie diese Anleitung für den späteren Gebrauch auf.
3. Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie Keine Flüssig-oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.
4. Die NetzanschluBsteckdose soll nahe dem Gerät angebracht und leicht zugänglich sein.
5. Das Gerät ist vor Feuchtigkeit zu schützen.
6. Bei der Aufstellung des Gerätes ist auf sicheren Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen.
7. Die Belüftungsöffnungen dienen zur Luftzirkulation die das Gerät vor Überhitzung schützt. Sorgen Sie dafür, daß diese Öffnungen nicht abgedeckt werden.
8. Beachten Sie beim AnschluB an das Stromnetz die AnschluBwerte.
9. Verlegen Sie die NetzanschluBleitung so, daß niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.
10. Alle Hinweise und Warnungen die sich am Geräten befinden sind zu beachten.
11. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.

12. Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. elektrischen Schlag auslösen.
13. Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von autorisiertem Servicepersonal geöffnet werden.
14. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:
 - a - Netzkabel oder Netzstecker sind beschädigt.
 - b - Flüssigkeit ist in das Gerät eingedrungen.
 - c - Das Gerät war Feuchtigkeit ausgesetzt.
 - d - Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.
 - e - Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.
 - f - Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.
15. VOSICHT: Explosionsgefahr bei unsachgemäßen Austausch der Batterie. Ersatz nur durch denselben oder einem vom Hersteller empfohlene-mahnlichen Typ. Entsorgung gebrauchter Batterien nach Angaben des Herstellers.
16. ACHTUNG: Es besteht die Explosionsgefahr, falls die Batterie auf nicht fach-männische Weise gewechselt wird. Verfangen Sie die Batterie nur gleicher oder entsprechender Type, wie vom Hersteller empfohlen. Entsorgen Sie Batterien nach Anweisung des Herstellers.

Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70dB(A) oder weniger.

Haftungsausschluss: Die Bedienungsanleitungen wurden entsprechend der IEC-704-1 erstellt. Advantech lehnt jegliche Verantwortung für die Richtigkeit der in diesem Zusammenhang getätigten Aussagen ab.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

1. To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
2. Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

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2

CHAPTER
1

Overview

This chapter gives background information on the ARK-3381. It shows you the ARK-3381 overview and specifications.

Sections include:

- Introduction
- Hardware Specifications
- Chassis Dimension

Chapter 1 Overview

1.1 Introduction

The ARK-3381 Fanless Embedded Box Computer combines a rich display interface and comprehensive industrial features into a rugged, compact metal chassis for multimedia intensive applications. The fanless operation provides noise protection to the platform when deployed in external environments. The ARK-3381 Embedded Box Computer is ideally suited for embedded PC applications. All electronics are protected in a compact sealed housing for convenient embedded and stand alone applications, where space and environment considerations are critical.

1.2 Features

1.2.1 Serial Port and Parallel Port Intensive

- Multiple serial port interfaces: 5 x RS-232/422/485 serial ports and two RS-232 serial ports
- Dual PCI 1284 Printer Ports
- Ideal for field measurement and operator control applications in diversified automation control markets

1.2.2 Highly Robust Casting Construction

- Fanless operation in aluminum sealed construction
- A special cushioned design that absorbs vibration to ensure maximum reliability under harsh conditions

1.2.3 Highly Compact Size

- With its maximum mounting height of 69 mm, the ARK-3381 can be used under space critical installation conditions

1.2.4 Optimized Integration

- Few parts, easy integration, easy maintenance to reduce investment
- Systems are supplied ready to run
- Long life cycle support for product continuity

1.2.5 Wide Range of Power Sources

- Wide range of DC 12 V ~ 24 V power source offers flexibility of power input for various automation environments

1.2.6 High Computing Performance

- Scalable Low Voltage and Ultra Low Voltage Pentium® M class processor system
- Ethernet networking capability for high computing performance

1.3 Hardware Specification

1.3.1 Processor Core Logic System

CPU

- Intel® Ultra Low Voltage Celeron® M or Intel® Pentium® M Low Voltage Processor, µFC-BGA 479 Package:
 - ULV Celeron® M 1 GHz (for Model of ARK-3381-2S0A2E)
 - LV Pentium® M 1.4 GHz (for Model of ARK-3381-2S4A2E)

System Chipset

- Intel® 852GM or Intel® 855GME Memory Controller Hub (GMCH) Chipset:
 - Intel® 852GM for model of ARK-3381-2S0A2E
 - Intel® 855GME for model of ARK-3381-2S4A2E
- Intel® FW82801DB I/O Controller Hub 4 (ICH4) Chipset
- 400 MHz FSB

BIOS

- 4Mbit Flash BIOS, supports Plug & Play

Power Management

- Support ATX, APM Rev 1.2 and ACPI

System Memory

- One 200 pin SO-DIMM socket
- Supports DDR SDRAM up to 1 GB

1.3.2 Display

Chipset

- Integrated graphics built-in Intel® 852GM GMCH, or Intel® 855GME GMCH, utilizing Intel® Extreme Graphics 2 technology

Display Memory

- Dynamic video memory allocation up to 64 MB

Display Interface

- CRT Interface
- 36-bit LVDS interface, optional support up to 48-bit

Ethernet

- Ethernet Controller: Intel® 82551QM Ethernet Controller
- Speed: 10/100MBps, IEEE 802.3u (100 BASE-T) protocol compatible

Parallel Port

- Supports Dual PCI 1284 Printer Ports

Serial Port

- One Full Functional RS-232 Serial port as COM1
- Five RS-232/422/485 Serial port as COM2 ~ COM6
- One RS-232 Serial port support Tx/Rx function only (without support of Handshaking) as COM7

Note:

- *The default setting of COM2 ~ COM6 is RS-232.*
- *The RS-422/485 mode of COM2 can be setup by replacing the internal cable and adjusting a jumper inside the system*
- *The RS-422/485 mode of COM3 ~ COM7 can be setup via the BIOS*

Other

- Watchdog Timer: 255 levels timer interval, setup by software
- Keyboard/Mouse: One PS/2 port to support PS/2 Mouse and PS/2 keyboard
- USB: One USB 2.0 compliant universal serial bus port

Storage

- Supports a drive bay space for 2.5" HDD
- Supports a CompactFlash socket for Type I/II CompactFlash disk

Mechanical

- Construction: Aluminum housing
- Mounting: DIN-rail mounting, Desk/wall mounting
- Dimension (W x H x D): 264.5 x 69.2 x 137.25 (10.41" x 2.72" x 4.4")
- Weight: 2 kg

Power Supply

- Output Rating 46 W, ATX Support
- Fuse Rating 7 A @ 125 V
- Input Voltage: 12 VDC ~ 24 VDC,
Typical:

12 VDC @ 4.5A,
16 VDC @ 3.4 A,
19 VDC @ 2.9 A,
24 VDC @ 2.3 A

- Output Voltage:
 - +5 VDC @ 7 A
 - +12 VDC @ 0.5 A
 - +5 VSB @ 1 A

1.3.3 Environment Specifications

Operating temperature

- With Industrial Grade CompactFlash Disk only: -20 to 60° C
- With 2.5-inch Hard Disk: 0 to 45° C

Relative humidity

- 95% @ 40° C (non-condensing)

Vibration loading during operation

- With CompactFlash Disk only:
5 Grms, IEC 68-2-64, random, 5 ~ 500 Hz, 1 Oct./min, 1 hr/axis
- With 2.5-inch hard disk:
1 Grms, IEC 68-2-64, random, 5 ~ 500 Hz, 1 Oct./min, 1 hr/axis

Shock during operation

- With CompactFlash Disk only:
50 Grms, IEC 68-2-27, half sine, 11 ms duration
- With Hard Disk:
20 Grms, IEC 68-2-27, half sine, 11 ms duration

EMC approved

- CE, FCC Class A

Safety approved

- UL

1.4 Chassis Dimension

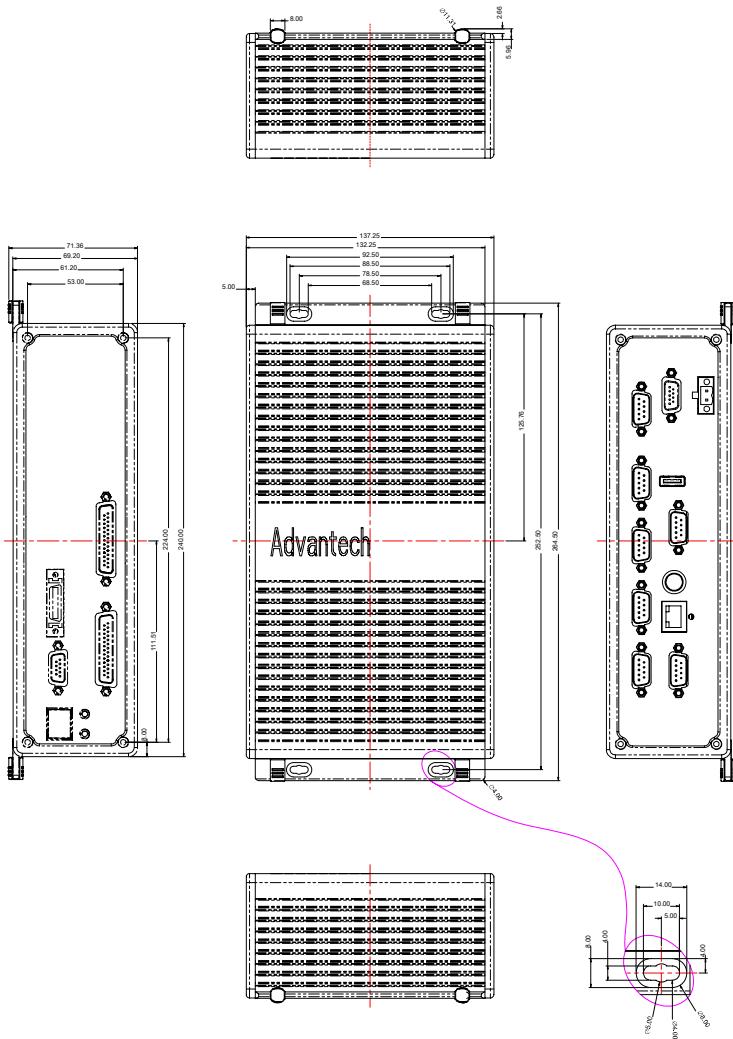


Figure 1.1: Chassis Dimensions

CHAPTER
2

Hardware Functionality

This chapter shows how to set up the ARK-3381's hardware functions, including connecting peripherals, switches and indicators.

Sections include:

- Introduction of ARK-3381 External I/O Connectors
- ARK-3381 front metal face plate external I/O connectors
- ARK-3381 rear metal face plate external I/O connectors

Chapter 2 Hardware Functionality

2.1 Introduction of ARK-3381 External I/O Connectors

The following two figures show the external I/O connectors on ARK-3381. The following sections give you detailed information about the function of each I/O connector.

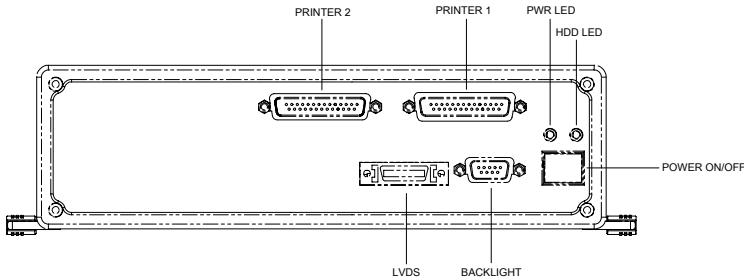


Figure 2.1: Front face plate I/O connectors

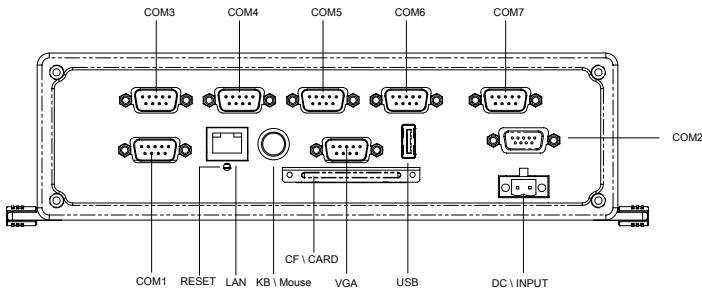


Figure 2.2: Rear face plate I/O connectors

2.2 ARK-3381 front face plate I/O connectors

2.2.1 Power ON/OFF Button

The ARK-3381 has an ATX supported Power On/Off button that supports Soft Power On/Off (Instant off or Delay 4 Second), and Suspend.

2.2.2 LED Indicators

There are two LEDs on the ARK-3381 front panel for indicating system status: Red flashing PWR LED is for power status and the green flashing HDD LED is for hard disk and CompactFlash disk status.

2.2.3 LVDS Connector

The ARK-3381 has a D-Sub 26-pin connector that carries LVDS signal outputs that can directly connect to LVDS LCD displays via a cable. JP6 on PCM-9380 or PCM-9386 motherboards is a jumper for selecting an LCD signal power of 5 V or 3.3 V. Refer to section 3.10 for details of JP6, and Chapter 6, “Full Disassembly Procedure” for set up information. The default setting of JP6 is 5 V.

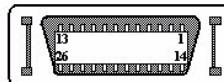


Figure 2.3: LVDS Connector

Table 2.1: LVDS Connector pin assignment

Pin	Signal name	Pin	Signal name
1	LVDS_CLKBP	14	LVDS_CLKBM
2	GND	15	LVDS_YAM0
3	LVDS_YAP0	16	LVDS_YAM1
4	LVDS_YAP1	17	LVDS_YAM2
5	LVDS_YAP2	18	LVDS_CLKAM
6	LVDS_CLKAP	19	GND
7	+3.3 or +5V	20	+3.3 or +5V
8	GND	21	LVDS_YAM3
9	LVDS_YAP3	22	LVDS_YBM0
10	LVDS_YBP0	23	LVDS_YBM1
11	LVDS_YBP1	24	LVDS_YBM2
12	LVDS_YBP2	25	LVDS_YBM3
13	LVDS_YBP3	26	GND

2.2.4 Backlight On/Off control Connector

The ARK-3381 has a D-Sub 9-pin connector that provides:

- BKLTEN signals that the inverter module uses to turn the backlight on or off.
- 12 V, 5 V and Ground as the inverter power source.

An additional VBR signal can be connected to the LCD's inverter to implement brightness adjustment via software.

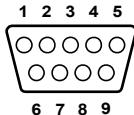


Figure 2.4: Backlight Connector

Table 2.2: Backlight Connector Pin Assignment

Pin	Signal name
1	+12V
2	GND
3	BKLTEN
4	VBR
5	+5V
6	LVDS_DCLK
7	LVDS_DDAT
8	Reserved
9	Reserved

2.2.5 Printer Port Connectors

The ARK-3381 provides two D-sub 25-pin connectors that support Dual PCI 1284 Printer Ports (PRINTER 1 and PRINTER 2).

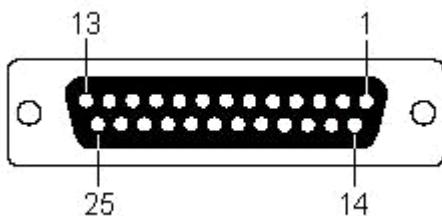


Figure 2.5: Printer Port Connector

Table 2.3: Printer Port Connector

Pin	Signal Name	Pin	Signal Name
1	STROBE*	14	AUTO FEED*
2	PD0	15	ERROR
3	PD1	16	INIT*
4	PD2	17	SELECT IN*
5	PD3	18	GND
6	PD4	19	GND
7	PD5	20	GND
8	PD6	21	GND
9	PD7	22	GND
10	ACK*	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SELECT		

Note: “” represents “No Connection”*

2.3 ARK-3381 rear face plate external I/O connectors

2.3.1 Power Input Connector

The ARK-3381 comes with a Phoenix connector that carries a 12 ~ 24 VDC external power input.

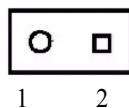


Figure 2.6: Power input connector

Table 2.4: Power input connector pin assignments

Pin	Signal Name
1	GND
2	+12 ~ 24 VDC

2.3.2 COM1 Connector

The ARK-3381 provides a D-sub 9-pin connector, which offers one standard RS-232 serial communication interface port for COM1.

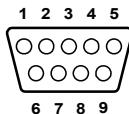


Figure 2.7: COM 1 Connector

Table 2.5: COM1 pin assignments

Pin	Signal Name
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

Table 2.5: COM1 pin assignments

Pin	Signal Name
9	RI

2.3.3 COM2 ~ COM6 Connector

The ARK-3381 provides five D-sub 9-pin connectors for RS-232/422/485 communications. The default setting of COM2 ~ COM6 is RS-232. Please refer to section 3.3 ~ 3.7 “Jumper Settings” and Chapter 6 “Full Disassembly Procedure” for set up information. The pin assignments of COM2 are different than COM3 ~ COM6. Table 2.5 and table 2.6 shows these differences.

The RS-422/485 mode of COM2 can be configured by replacing the internal COM2 cable with a new cable (Part Number of 1700001967), and adjusting a jumper. The new cable is in the accessory box.

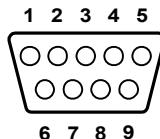


Figure 2.8: COM2 connector

Table 2.6: COM2 pin assignments

	RS-232	RS-422	RS-485
Pin	Signal Name	Signal Name	Signal Name
1	DCD	Tx-	DATA-
2	RxD	Tx+	DATA+
3	TxD	Rx+	NC
4	DTR	Rx-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

Note: NC represents “No Connection”

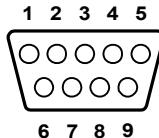


Figure 2.9: COM3 ~ COM6 connector

Table 2.7: COM 3~COM 6 pin assignments

	RS-232	RS-422	RS-485
Pin	Signal Name	Signal Name	Signal Name
1	DCD	Rx-	NC
2	RxD	Rx+	NC
3	TxD	Tx+	DATA+
4	DTR	Tx-	DATA-
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

Note: NC represents “No Connection”

2.3.4 COM7 Connector

The ARK-3381 provides a D-sub 9-pin connector, which offers one RS-232 serial port (COM7). It has Rx and Tx signals without handshaking. Refer to section 3.8 “Jumper Settings” and Chapter 6 “Full Disassembly Procedure” for configuration details.

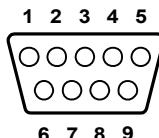


Figure 2.10: COM7 Connector

Table 2.8: COM 7 pin assignments

RS-232	
Pin	Signal Name
1	DCD (optional)
2	RxD
3	TxD
4	DTR (optional)
5	GND
6	DSR (optional)
7	RTS (optional)
8	CTS (optional)
9	RI (optional)

2.3.5 Ethernet Connector (LAN)

The ARK-3381 has an Intel 82551ER Ethernet controller that is fully compliant with IEEE 802.3u 10/100Base-T CSMA/CD standards. The Ethernet controller is connected to a standard RJ-45 jack socket with LED indicators to show its Active/Link status (Green LED) and Speed status (white LED).

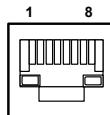


Figure 2.11: Ethernet Connector

Table 2.9: RJ-45 Connector pin assignments

Pin	10/100BaseT Signal Name
1	XMT+
2	XMT-
3	RCV+
4	NC
5	NC
6	RCV-
7	NC

Table 2.9: RJ-45 Connector pin assignments

Pin	10/100BaseT Signal Name
8	NC

2.3.6 Reset Button

Press the “Reset” button to reset the ARK-3381.

2.3.7 PS/2 Keyboard/Mouse Connector

The ARK-3381 provides a 6-pin mini-DIN PS/2 keyboard/mouse connector on the rear face plate. The ARK-3381 comes with an adapter to convert the 6-pin mini-DIN connector to two 6-pin mini-DIN connectors for PS/2 keyboard and PS/2 mouse connections.

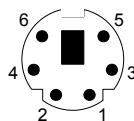


Figure 2.12: PS/2 Connector

Table 2.10: PS/2 Keyboard/Mouse connector pin assignments

Pin	Signal name
1	PS2_KBDAT
2	PS2_MSDAT
3	GND
4	VCC
5	PS2_KBCLK
6	PS2_MSCLK

2.3.8 VGA Connector

The ARK-3381 provides a D-sub 15-pin connector that supports a VGA monitor. It is driven by a graphics controller with 32 MB shared memory. This controller supports VGA and VESA video modes with resolutions up to 1600 x 1200 @ 85 Hz.

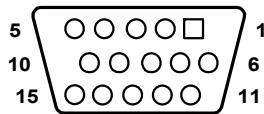


Figure 2.13: VGA Connector

Table 2.11: VGA connector pin assignment

Pin	Signal name
1	Red
2	Green
3	Blue
4	NC
5	GND
6	GND
7	GND
8	GND
9	NC
10	GND
11	NC
12	NC
13	H-SYNC
14	V-SYNC
15	NC

2.3.9 USB Connector

The ARK-3381 provides one USB interface, for complete Plug & Play and hot swapping of up to 127 devices. The USB interface is USB UHCI, Rev. 2.0 compliant and can be disabled in the system BIOS setup. Plug & Play and hot swap features enable you to connect or disconnect a device whenever you want, without turning off the computer.

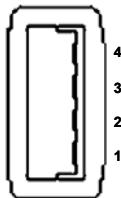


Figure 2.14: USB Connector

Table 2.12: USB1 Connector pin assignments

Pin	Signal Name	Pin	Signal Name
1	VCC	2	VCC
3	USB_P0-	4	USB_P1-
5	USB_P0+	6	USB_P1+
7	GND	8	GND
9	GND	10	NC

2

CHAPTER 3

Hardware Installation and Upgrade

Sections include:

- Jumpers and Connectors
- Installing the DDR SDRAM Memory Module
- Inserting a CompactFlash Card
- Installing the 2.5" Hard Disk Drive (HDD)
- Connecting Power

Chapter 3 Hardware Installation and Upgrade

3.1 Jumpers and Connectors

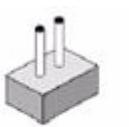
The ARK-3381 Embedded Box Computer consists of a PC-based computer that is housed in an aluminum top cover, a metal bottom case with accessed bottom cover and Front/ Rear Metal Face plate. Your HDD, SDRAM, are all readily accessible by removing the accessed bottom cover. Any maintenance or hardware upgrades can be easily completed after removing the top cover, and Front with Rear Metal Face plate. If you are a systems integrator and need to know how to completely disassemble the embedded box computer, you can find more useful information in Chapter 6.



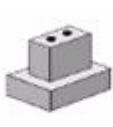
Warning! Do not remove any mechanical parts, such as the top cover, bottom cover and front with rear face plate until you have verified that no power is flowing within the Embedded Box Computer. Power must be switched off and the power cord must be unplugged. Every time you service the Embedded Box Computer, you should be aware of this.

3.2 Setting jumpers

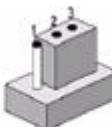
You can configure your ARK-3381 to match the needs of your application by setting jumpers. A jumper is the simplest kind of electrical switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper, you connect the pins with the clip. To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either pins 1 and 2 or pins 2 and 3.



open

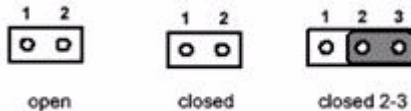


closed



closed 2-3

The jumper settings are schematically depicted in this manual as follows:



A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

3.3 COM2 RS-232/422/485 Jumper setting

(J3/J4/J5 Located on internal motherboard)

The COM2 port located on rear face plate of ARK-3381 unit which can be configured to operate in RS-232, RS-422 or RS-485 mode by setting up the Jumper Pins of J3/J4/J5 located on internal motherboard of ARK-3381 unit. The default setting of COM1 is RS-232.

Table 3.1: COM2 RS-232/422/485 Jumper Selection		
Function	Setting	
RS-232 *	J3 (1-2 closed)	(J4, J5 open)
RS-422	J4 (1-2 closed)	(J3, J5 open)
RS-485	J5 (1-2 closed)	(J3, J4 open)

*Default jumper setting

Refer to Chapter 6 “Full Disassembly Procedure of ARK-3381 Embedded Box Computer” for more details.

The default setting of COM2 is RS-232. The RS-422/485 mode can be configured by replacing the internal cable and adjusting the jumper inside the system.

3.4 COM3 RS-232/422/485 BIOS setting

The COM3 port connector located on the rear face plate of ARK-3381 unit can be configured to operate in RS-232, RS-422 or RS-485 mode by adjusting the “COM3 Mode” of “Integrated Peripherals” in the BIOS. Refer to Section 4.6 “Integrated Peripherals” to find out how to change this setting. The default setting of COM3 is RS-232.

3.5 COM4 RS-232/422/485 BIOS setting

The COM4 port connector located on the rear face plate of ARK-3381 unit can be configured to operate in RS-232, RS-422 or RS-485 mode by adjusting the “COM4 Mode” of “Integrated Peripherals” in the BIOS. Refer to Section 4.6 “Integrated Peripherals” to find out how to change this setting. The default setting of COM4 is RS-232.

3.6 COM5 RS-232/422/485 BIOS setting

The COM5 port connector located on the rear face plate of ARK-3381 unit can be configured to operate in RS-232, RS-422 or RS-485 mode by adjusting the “COM5 Mode” of “Integrated Peripherals” in the BIOS. Refer to Section 4.6 “Integrated Peripherals” to find out how to change this setting. The default setting of COM5 is RS-232.

3.7 COM6 RS-232/422/485 BIOS setting

The COM6 port connector located on the rear face plate of ARK-3381 unit can be configured to operate in RS-232, RS-422 or RS-485 mode by adjusting the “COM6 Mode” of “Integrated Peripherals” in the BIOS. Refer to Section 4.6 “Integrated Peripherals” to find out how to change this setting. The default setting of COM6 is RS-232.

3.8 COM7 RS-232 Jumper Setting

(JP15/JP16 Located on internal I/O board)

The COM7 port connector located on rear face plate of ARK-3381 can be configured via JP15 and JP16. Refer to table 3.2 and table 3.3 for more details. The default setting is “DTR#5”.

Table 3.2: COM7 (DTR#5/RTS#5) Selection

Function	JP15
DTR#5 *	1-2 (closed)
RTS#5	2-3 (closed)

*Default jumper setting

Table 3.3: COM7 (DCD#5/DSR#5/CTS#5/RI#5) Selection

Function	JP16
DCD#5 *	1-2
DSR#5	3-4
CTS#5	5-6
RI#5	7-8

*Default jumper setting

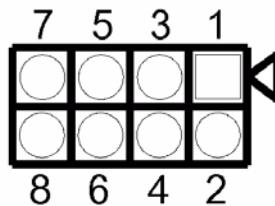
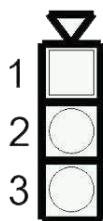


Figure 3.1: JP15 Jumper pin layout Figure 3.2: JP16 Jumper pin layout

3.9 COM3~COM6 Ring / Voltage Selection

(JP19/JP20 Located on internal I/O board)

The “RI” signal pin of COM3 ~ COM6 can be configured to carry 5 V or 12 V power; or the wake on ring signal.

Table 3.4: COM3 Ring/Voltage Selection

Serial port	Function	JP19	JP20
COM 3	5 V	2-4 closed	open
	12 V	4-6 closed	open
	wake on ring*	open*	1-2 closed*

*Default jumper setting

Table 3.5: COM4 Ring/Voltage Selection

Serial port	Function	JP19	JP20
COM 4	5 V	1-3 closed	open
	12 V	3-5 closed	open
	wake on ring*	open*	3-4 closed*

*Default jumper setting

Table 3.6: COM5 Ring/Voltage Selection

Serial port	Function	JP19	JP20
COM 5	5 V	10-12 closed	open
	12 V	12-14 closed	open
	wake on ring*	open*	5-6 closed*

*Default jumper setting

Table 3.7: COM6 Ring/Voltage Selection

Serial port	Function	JP19	JP20
COM 6	5 V	11-9 closed	open
	12 V	11-13 closed	open
	wake on ring*	open*	7-8 closed*

*Default jumper setting

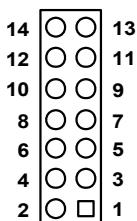


Figure 3.3: JP19 Jumper pin layout

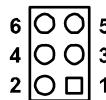


Figure 3.4: JP20 Jumper pin layout

3.10 LCD Power Jumper Setting (J6)

The ARK-3381 series of embedded box computer provides a jumper (JP6) on the internal PCM-9380 or PCM-9386 motherboard for selecting 5 V or 3.3 V LCD signal power. When you connect your LVDS LCD panel display, you need to configure JP6 to select the correct LCD power setting.

Table 3.8: LCD Power Setting (J6)

Close pins	Function
1-2	+5 V*
2-3	+3.3 V

*Default jumper setting

Refer to Chapter 6, “Full Disassembly Procedure” to set JP6. The default setting of JP6 is 5 V.

3.11 Installing the DDR SDRAM Memory Module

The ARK-3381 provides one 200-pin SODIMM (Small Outline Dual Inline Memory Module) socket and supports 2.5 V DDR SDRAM. You can install from 64 MB to 1 GB of DDR SDRAM memory.

Follow these steps to install an SODIMM into the ARK-3381:

1. Remove the power cord.
2. Unscrew the four screws from the bottom cover of the ARK-3381.
3. Remove the bottom cover.
4. Insert a DDR SDRAM SODIMM.
5. Replace the bottom cover with four screws.

3.12 Inserting a CompactFlash Card

Follow these steps to install a CompactFlash card into the ARK-3381:

1. Remove the power cord.
2. Unscrew the two screws from the CF Door on the rear face plate.



Figure 3.5:

3. Remove the CF carrier.

4. Insert a CompactFlash card with your OS or application program into the CF carrier.



Figure 3.6:



Figure 3.7:

5. Insert the CF Carrier in to the ARK-3381 and replace the 2 screws.



Figure 3.8:

Note: The CompactFlash socket is a secondary IDE Master.

3.13 Installing the 2.5" Hard Disk Drive (HDD)

You can attach one enhanced Integrated Device Electronics (IDE) hard disk drive to the ARK-3381's internal controller. The advanced IDE controller uses a PCI bus interface, supports faster data transfer rates and supports IDE hard drives larger than 528 MB. Follow these steps to install a HDD:

1. Remove the power cord.
2. Unscrew the four screws from bottom cover of the ARK-3381.
3. Remove the bottom cover of the ARK-3381.
4. Connect the IDE flat cable to the connector on the hard disk.
5. Attach the bottom cover with the four screws.

3.14 Connecting Power

Connect the ARK-3381 to a 12 ~ 24 VDC power source. The power source can either be from a power adapter or an in-house power source.

3.15 Installation of DIN Rail Mounting

Follow these steps to mount the ARK-3381 on a DIN Rail.

1. Remove the rubber feet from the ARK-3381.



Figure 3.9: ARK-3381 with rubber feet

2. Find the DIN Rail Mounting Kit in the ARK-3381 accessory box. This kit has 2 pieces: an L DIN Rail Mounting Module (Left) and a R DIN Rail Mounting Module (Right).

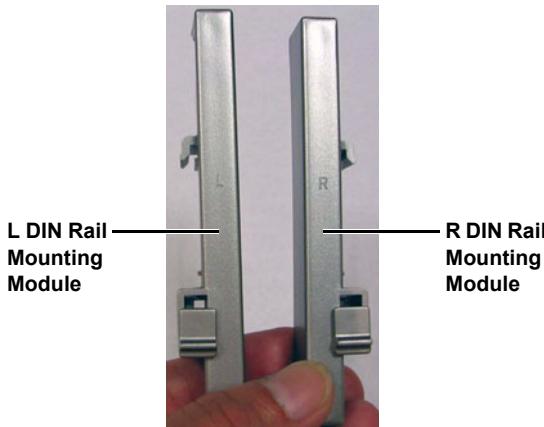


Figure 3.10: DIN Rail Mounting Kit

3. Attach the L DIN Rail Mounting Module and the R DIN Rail Mounting Module to the ARK-3381.



Figure 3.11: DIN Rail Mounting Module orientation



Figure 3.12: L DIN Rail Mounting Module on ARK-3381



Figure 3.12: R DIN Rail Mounting Module on ARK-3381



Figure 3.13: A DIN Rail

4. Hook the ARK-3381 on to the DIN Rail.

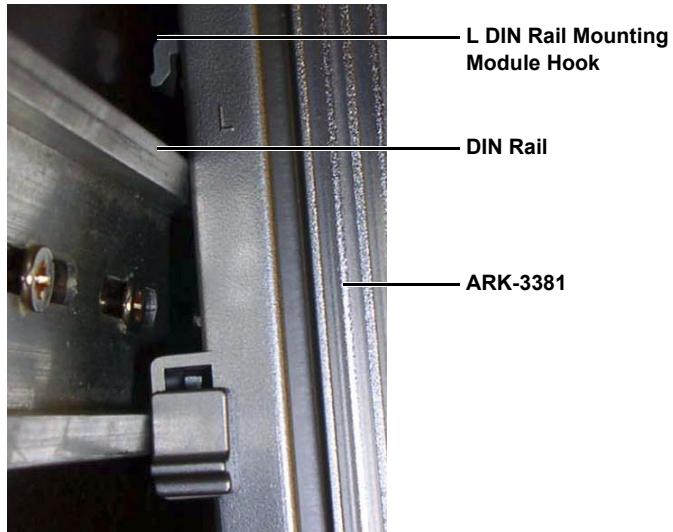


Figure 3.14: Hooking the L DIN Rail Mounting Module to a DIN Rail

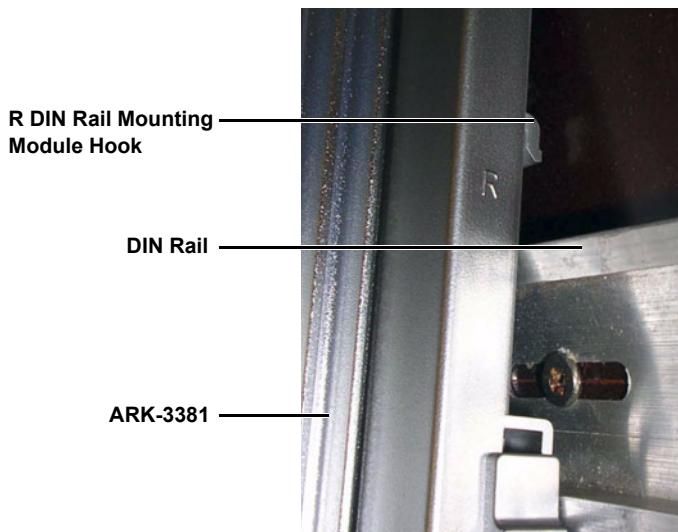


Figure 3.15: Hooking the R DIN Rail Mounting Module to a DIN Rail

5. Pull the L DIN Mounting Module and R DIN Mounting Module Hook Switches away from the DIN Rail. Push the L DIN Mounting Module and R DIN Mounting Module Hook Switches toward the DIN Rail to fix the ARK-3381 to the DIN Rail.

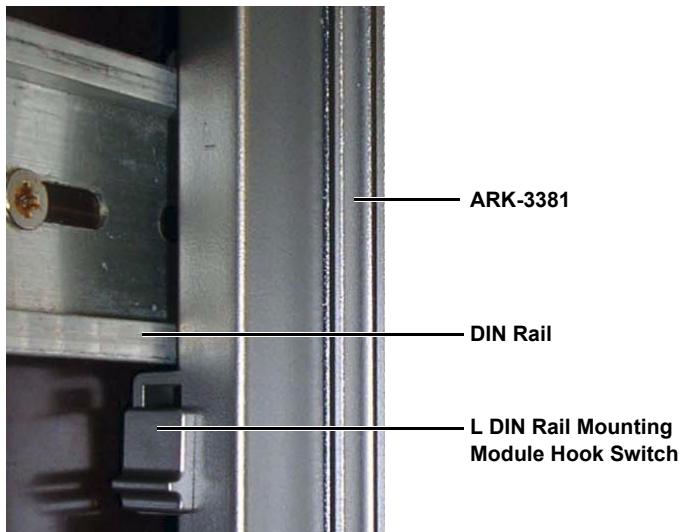


Figure 3.16: Setting the L DIN Rail Mounting Module Hook Switch

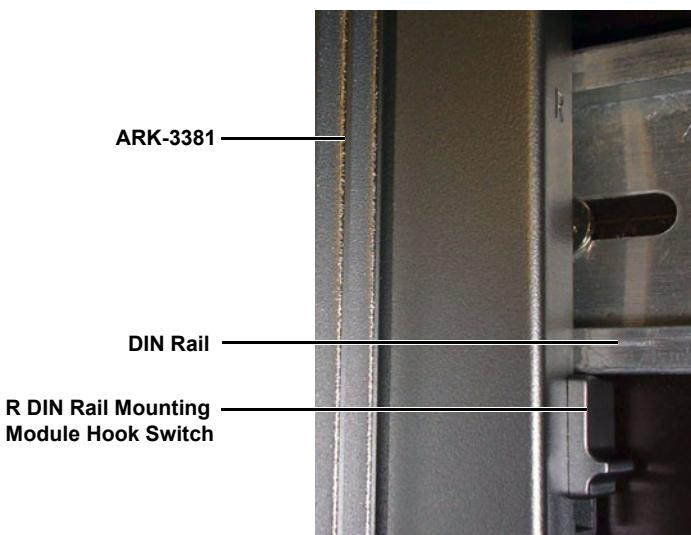


Figure 3.17: Setting the R DIN Rail Mounting Module Hook Switch

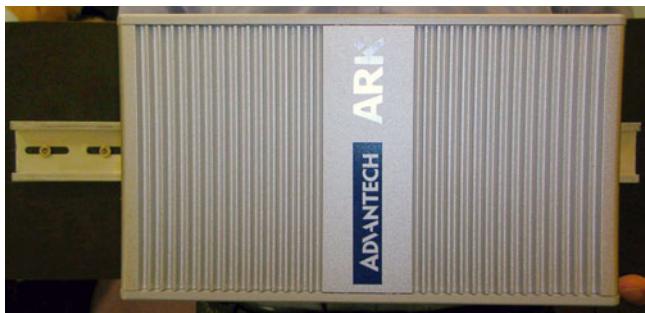


Figure 3.18: ARK-3381 mounted on a DIN Rail

2

CHAPTER

4

Award BIOS Setup

Chapter 4 Award BIOS Setup

4.1 Introduction

Award's BIOS ROM has a built-in setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed memory (CMOS RAM) so that it retains the setup information when the power is turned off.

4.1.1 CMOS RAM Auto-backup and Restore

The CMOS RAM is powered by an onboard button cell battery. When you finish BIOS setup, the data in CMOS RAM will be automatically backed up to Flash ROM. If operation in a harsh industrial environment causes a soft error, the BIOS will check the data in CMOS RAM and automatically restore the original data from Flash ROM to CMOS RAM for booting.

Note: If you intend to change the CMOS setting without restoring the previous backup, you have to click on “DEL” within two seconds of the “CMOS checksum error...” display screen message appearing. Then enter the “Setup” screen to modify the data. If the “CMOS checksum error...” message appears again and again, please check to see if you need to replace the battery in your system.

4.2 Entering Setup

Turn on the computer and check for the “patch code”. If there is a number assigned to the patch code, it means that the BIOS supports your CPU. If there is no number assigned to the patch code, please contact Advantech's applications engineer to obtain an up-to-date patch code file. This will ensure that your CPU's system status is valid. After ensuring that you have a number assigned to the patch code, press to allow you to enter the setup.



Figure 4.1: Award BIOS Setup initial screen

4.3 Standard CMOS Setup

Choose the “Standard CMOS Features” option from the “Initial Setup Screen” menu, and the screen below will be displayed. This menu allows users to configure items such as date, time, hard disk drive, floppy drive, display, and memory.

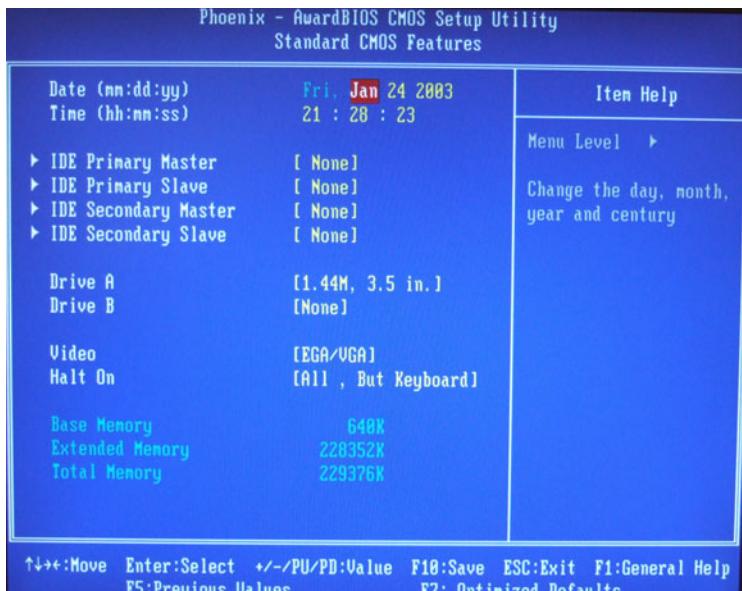


Figure 4.2: Standard CMOS features screen

4.4 Advanced BIOS Features

The “Advanced BIOS Features” screen appears when choosing the “Advanced BIOS Features” item from the “Initial Setup Screen” menu. It allows the user to configure the ARK-3389 according to their particular requirements. Below are some major items that are provided in the Advanced BIOS Features screen. A quick booting function is provided for your convenience. Simply enable the Quick Booting item to save yourself valuable time



Figure 4.3: Advanced BIOS features screen

4.4.1 CPU Feature

Press Enter to configure CPU Features.

4.4.2 Virus Warning

If enabled, a warning message and alarm beep activates if someone attempts to write here. The commands are “Enabled” or “Disabled.”

4.4.3 CPU L1 & L2 Cache

Enabling this feature speeds up memory access. The commands are “Enabled” or “Disabled.”

4.4.4 Quick Power On Self Test

The computer conducts a Power-On Self Test (POST) when it is turned on. When enabled, the BIOS shortens or skips some of the items during the test. When disabled, the computer conducts normal POST procedures.

4.4.5 First/Second/Third/ Boot Other Device

The BIOS tries to load the OS with the devices in the sequence selected. Choices are: Floppy, LS/ZIP, HDD, SCSI, CDROM, LAN, Disabled.

4.4.6 Swap Floppy Drive

Logical name assignments of floppy drives can be swapped if there is more than one floppy drive. The commands are “Enabled” or “Disabled.”

4.4.7 Boot UP Floppy Seek

Selection of the command “Disabled” will speed the boot up. Selection of “Enabled” searches disk drives during boot up.

4.4.8 Boot Up NumLock Status

This feature selects the “power on” state for NumLock. The commands are “Enabled” or “Disabled.”

4.4.9 Gate A20 Option

Normal: The keyboard controller controls GateA20.

Fast (Default): The chipset controls GateA20.

4.4.10 Typematic Rate Setting

The typematic rate is the rate key strokes repeat as determined by the keyboard controller. The commands are “Enabled” or “Disabled.” Enabling allows the typematic rate and delay to be selected.

4.4.11 Typematic Rate (Chars/Sec)

The BIOS accepts the following input values (characters/second) for the typematic rate: 6, 8, 10, 12, 15, 20, 24, 30.

4.4.12 Typematic Delay (msec)

Typematic delay is the time interval between the appearance of two consecutive characters, when holding down a key. The typmatic rate can be 250, 500, 750 or 1000 ms.

4.4.13 Security Option

This field allows you to limit access to the System and Setup. The default value is **Setup**. When you select System, the system prompts for the User Password every time you boot up. When you select Setup, the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

4.4.14 APIC Mode

APIC stands for Advanced Programmable Interrupt Controller. The default setting is **Enabled**.

4.4.15 MPS Version Control For OS

This option specifies the MPS (Multiprocessor Specification) version for your operating system. MPS version 1.4 added extended configuration tables to improve support for multiple PCI bus configurations and improve future expandability. The default setting is **1.4**.

4.4.16 OS Select for DRAM > 64 MB

This option allows the system to access greater than 64 MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is **Non-OS/2**.

4.4.17 Report No FDD For WIN 95

If you are using Windows 95/98 without a floppy disk drive, select Enabled to release IRQ6. This is required to pass Windows 95/98's SCT test. You should also disable the Onboard FDC Controller in the Integrated Peripherals screen when there's no floppy drive in the system. If you set this feature to Disabled, the BIOS will not report the missing floppy drive to Win95/98.

4.4.18 Small Logo (EPA) Show

The EPA logo appears at the right side of the monitor screen when the system is boot up. The default setting is Enabled.

4.5 Advanced Chipset Features

This screen appears when choosing the “Advanced Chipset Features” item from the “Initial Setup Screen” menu. It allows the user to configure the system chipset according to their particular requirements. Below are some major items that are provided in the Advanced Chipset Features screen.



Figure 4.4: Advanced Chipset features screen

4.5.1 DRAM Timing Selectable

This option refers to the method by which the DRAM timing is selected. The default is **By SPD**.

4.5.2 CAS Latency Time

You can configure CAS latency time in HCLKs as 2 or 2.5 or 3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

4.5.3 Active to Precharge Delay

The default setting for the Active to Precharge Delay is **7**.

4.5.4 DRAM RAS# to CAS# Delay

This option allows you to insert a delay between the RAS (Row Address Strobe) and CAS (Column Address Strobe) signals. This delay occurs when the SDRAM is written to, read from or refreshed. Reducing the delay improves the performance of the SDRAM.

4.5.5 DRAM RAS# Precharge

This option sets the number of cycles required for the RAS to accumulate its charge before the SDRAM refreshes. The default Precharge Delay is 3.

4.5.6 DRAM Data Integrity Mode

Select **ECC** if your memory module supports it. The memory controller will detect and correct single-bit soft memory errors. The memory controller can also be able to detect double-bit errors though it cannot correct them. This provides increased data integrity and system stability.

4.5.7 MGM Core Frequency

This field sets the frequency of the DRAM memory installed. The default setting is **Auto Max 266MHz**.

4.5.8 System BIOS Cacheable

The setting of **Enabled** allows caching of the system BIOS ROM at F000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

4.5.9 Video BIOS Cacheable

The Setting **Enabled** allows caching of the video BIOS ROM at C0000h-F7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

4.5.10 Memory Hole At 15M-16M

In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16 MB. The choices are **Enabled** and **Disabled**.

4.5.11 Delayed Transaction

The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select **Enabled** to support compliance with PCI specification version 2.1.

4.5.12 Delay Prior to Thermal

This field activates the CPU thermal function after the systems boots for the set number of minutes. The options are **16Min** and **64Min**.

4.5.13 AGP Aperture Size (MB)

The field sets the AGP aperture size. The AGP aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The default setting is **64M**.

4.5.14 On-Chip VGA

The default setting is **Enabled**.

4.5.15 On-Chip Frame Buffer Size

The default setting is **32MB**. The options available include 1MB, 4MB, 8MB and 16MB.

4.5.16 Boot Display

The default setting is **VBIOS Default** to allow system to detect the connected display device automatically. The options available include **VBIOS-Default, CRT, LVDS, CRT+LVDS**.

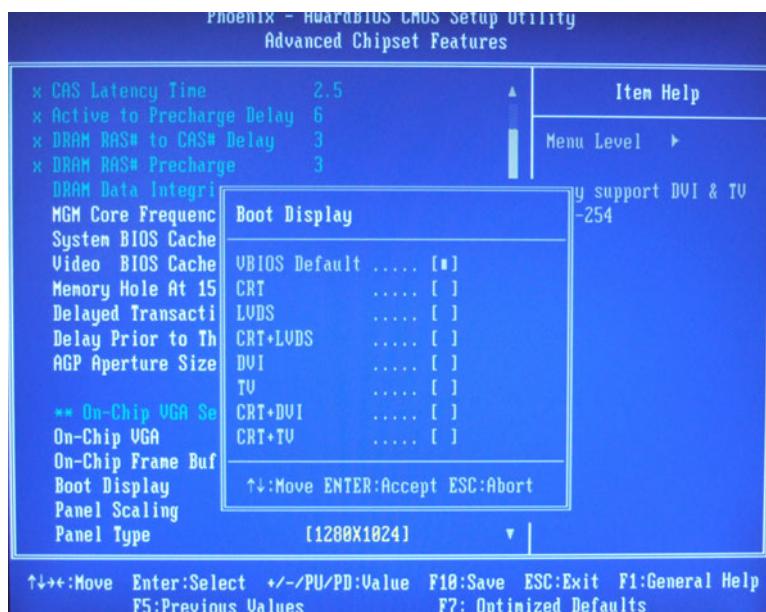


Figure 4.5: Boot Display

4.5.17 Panel Scaling

The default setting is **Auto**. The options available include **On** and **Off**.

4.5.18 Panel Type

These fields allow you to select the resolution of LCD Panel type. The resolution values for these ports are:

- 640 x 480
- 800 x 600
- 1024 x 768
- 1280 x 1024
- 1600 x 1200

The default setting is **1280 x 1024**

4.6 Integrated Peripherals

This section sets configurations for your hard disk and other integrated peripherals. The first screen shows three main items for user to select. Once an item selected, a submenu appears. Details follow.



Figure 4.6: Integrated Peripherals

4.6.1 IDE Cable Detect

Some UDMA cables use a hole in the ribbon cable as a cable detect mechanism to determine if a UDMA IDE or standard IDE cable is installed. The default setting is “Enabled”.

4.6.2 On Chip IDE Device

Move the cursor to this field and press <Enter>. The following screen will appear.

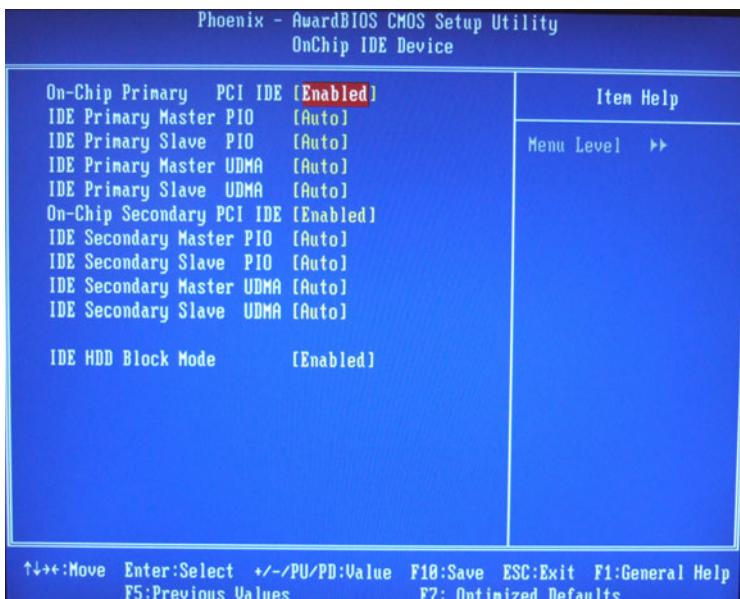


Figure 4.7: OnChip IDE Device

On-Chip Primary PCI IDE and On-Chip Secondary PCI IDE

These fields allow you to enable or disable the primary and secondary IDE controller. The default is **Enabled**. Select **Disabled** if you want to add a different hard drive controller.

IDE Primary Master/Slave PIO and IDE Secondary Master PIO

PIO means Programmed Input/Output. Rather than have the BIOS issue a series of commands to affect a transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by itself. Your system supports five modes, 0 (default) to 4, which primarily differ in timing. When **Auto** is selected, the BIOS will select the best available mode after checking your drive.

Auto:	The BIOS will automatically set the system according to your hard disk drive's timing. Mode 0-4 You can select a mode that matches your hard disk
Mode 0-4:	You can select a mode that matches your hard disk drive's timing. Caution: Do not use the wrong setting or you will have drive errors.

IDE Primary Master/Slave UDMA and IDE Secondary Master UDMA

These fields allow you to set the Ultra DMA in use. When Auto is selected, the BIOS will select the best available option after checking your hard drive or CD-ROM.

Auto:	The BIOS will automatically detect the settings for you.
Disabled:	The BIOS will not detect these categories.

On-Chip IDE HDD Block Mode

Enabled:	The IDE HDD uses the block mode. The system BIOS will check the hard disk drive for the maximum block size the system can transfer. The block size will depend on the type of hard disk drive.
Disabled:	The IDE HDD uses the standard mode.

4.6.3 Onboard Device

Move the cursor to this field and press <Enter>. The following screen will appear.

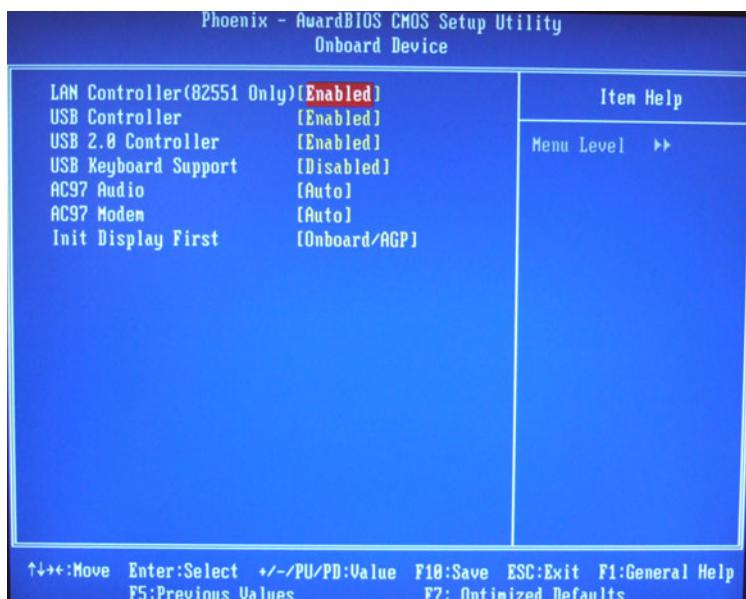


Figure 4.8: On Board Device

LAN Controller (82551 Only)

This field is used to **enable** or **disable** the Intel 82551 LAN controller.

USB Controller

Select **Enabled** if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals. The choices: **Enabled**, **Disabled**.

USB 2.0 Controller

If you are using USB 2.0, this field must be set to **Enabled**.

USB Keyboard Support

Select **Enabled** if user plan to use an USB keyboard under DOS. The choice: **Enabled**, **Disable**.

AC97 Audio

Select **Disable** if you do not want to use AC-97 audio. Option is **Auto**, **Disable**.

Init Display First

This item allows you to choose which one to activate first, PCI Slot or onboard VGA. The choices: PCI Slot, Onboard/AGP.

4.6.4 Super IO Device

Move the cursor to this field and press <Enter>. The following screen will appear.



Figure 4.9: Super IO Device

The screen shown above shows all the fields available in the Super IO Device submenu for ease of reference in this manual. In the actual CMOS setup, you have to use the scroll bar to view the fields. The settings on the screen are for reference only. Your version may not be identical to this one.

Onboard FDC Controller

When enabled, this field allows you to connect your floppy disk drives to the onboard floppy disk drive connector instead of a separate controller card. If you want to use a different controller card to connect the floppy disk drives, set this field to Disabled.

Note: ARK-3381 series embedded box computers do not have an onboard FDD controller.

Onboard Serial Port 1

You can disable the COM1 serial port by selecting “**Disabled**”. Select “**Auto**” to allow the BIOS to automatically allocate resources for COM1, or manually select an IRQ / IO address combination. The options are:

- Disabled
- 3F8/IRQ4
- 2FB/IRQ3
- 3E8/IRQ4
- 2E8/IRQ3
- Auto

The default setup value of COM1 (Onboard Serial Port 1) is “**3F8/IRQ4**”.

Onboard Serial Port 2

You can disable the COM2 serial port by selecting “**Disabled**”. Select “**Auto**” to allow the BIOS to automatically allocate resources COM2, or manually select an IRQ / IO address combination. The options are:

- Disabled
- 3F8/IRQ4
- 2FB/IRQ3
- 3E8/IRQ4
- 2E8/IRQ3
- Auto

The default setup value of COM2 (Onboard Serial Port 2) is “**2F8/IRQ3**”.

4.6.5 COM3 Mode

This field enables **COM3** to be configured as an RS-232, RS-422 or RS-485 port. The default setup value is **RS-232**; refer to Figure 4.10 to set it.

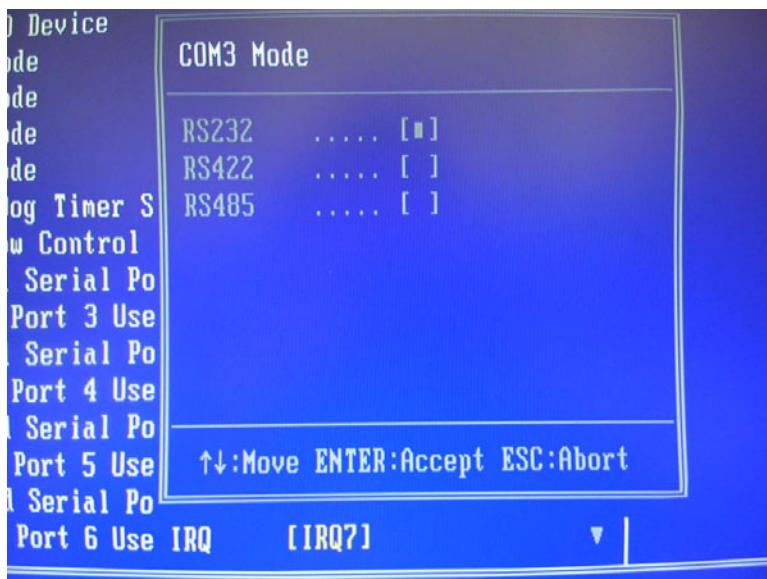


Figure 4.10: COM3 Mode

4.6.6 COM4 Mode

This field enables COM4 to be configured as an RS-232, RS-422 or RS-485 port. The default setup value is **RS-232**; refer to Figure 4.11 to set it.

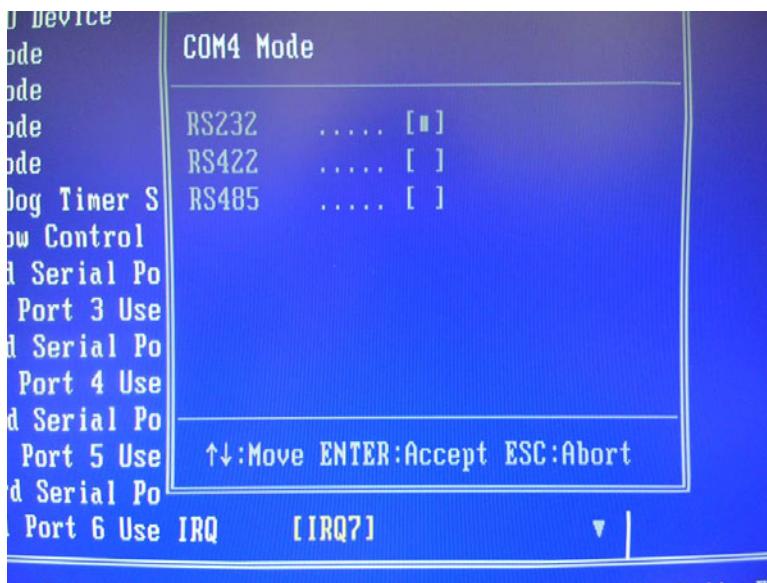


Figure 4.11: COM4 Mode

4.6.7 COM5 Mode

This field enables **COM5** to be configured as an RS-232, RS-422 or RS-485 port. The default setup value is **RS-232**; refer to Figure 4.12 to set it.

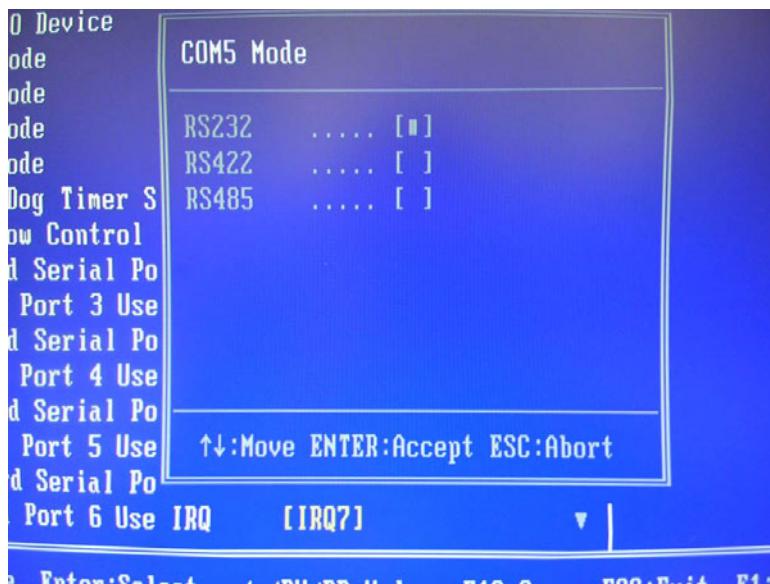


Figure 4.12: COM5 Mode

4.6.8 COM6 Mode

This field enables **COM6** to be configured as an RS-232, RS-422 or RS-485 port. The default setup value is **RS-232**; refer to Figure 4.13 to set it.

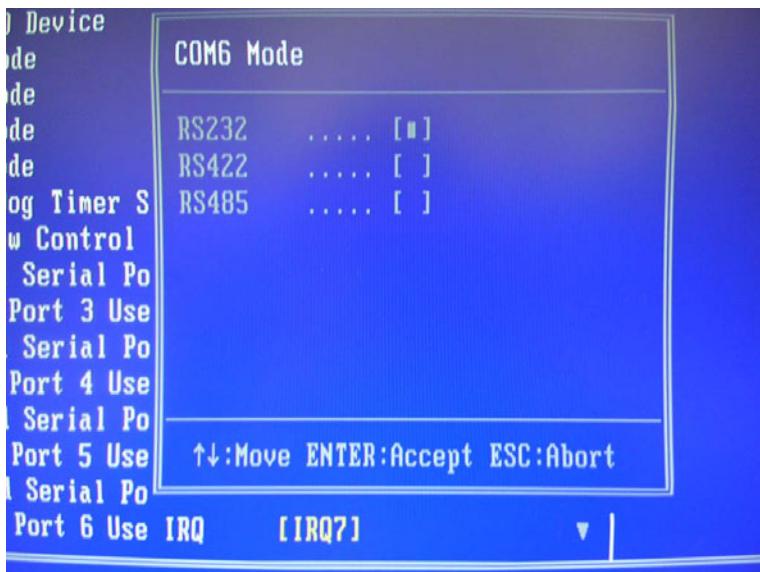


Figure 4.13: **COM6 Mode**

4.6.9 Watchdog Timer Select

When any program unexpectedly halts, the Watchdog Timer will automatically reset the CPU or generate an interrupt after a preset period. The Watchdog Timer is an independent hardware-only device that doesn't need the real-time clock chip. This ensures reliability in an unmanned or standalone system. The setup options are “**Disabled**”, “**10 Sec**”, “**20 Sec**”, “**30 Sec**”, “**40 Sec**”, “**1 Min**”, “**2 Min**”, and “**4 Min**”.

The default setup value is “**Disabled**”

4.6.10 AutoFlow Control

This item configures the AutoFlow Control functions of the RS-485 mode of COM3, COM4, COM5 and COM6. If you choose **Enable**, this function senses the direction of the data flow and switches the direction of transmission automatically. No handshaking is necessary. The options are **Enable** or **Disable**.

4.6.11 Onboard Serial Port 3/4/5/6/7

The field allows you to set the I/O addresses for:

- **Onboard Serial Port 3 (COM3)**
- **Onboard Serial Port 4 (COM4)**
- **Onboard Serial Port 5 (COM5)**
- **Onboard Serial Port 6 (COM6)**
- **Onboard Serial Port 7 (COM7)**

The setup options are “**Disabled**”, “**4F8**”, “**4E8**”, “**3E8**”, “**2E8**”, “**3E0**”, “**2E0**”. Leave this field on the default setting value.

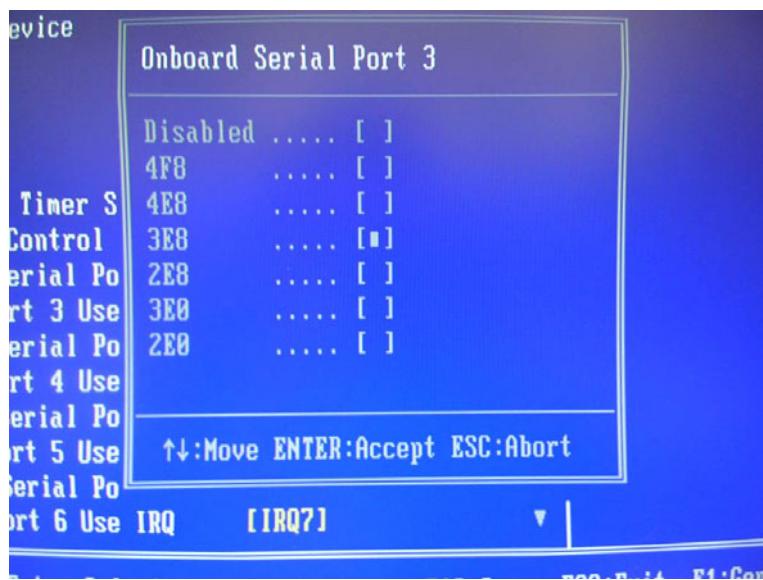


Figure 4.14: Onboard Serial Port 3

4.6.12 Serial Port 3/4/5/6/7 Use IRQ

The field allows you to set the IRQ for:

- **Onboard Serial Port 3 (COM3)**
- **Onboard Serial Port 4 (COM4)**
- **Onboard Serial Port 5 (COM5)**
- **Onboard Serial Port 6 (COM6)**
- **Onboard Serial Port 7 (COM7)**

The Setup options are “IRQ3”, “IRQ4”, “IRQ5”, “IRQ6”, “IRQ7”, “IRQ10”, “IRQ11”, and “IRQ12”. Leave this field on the default setting value.

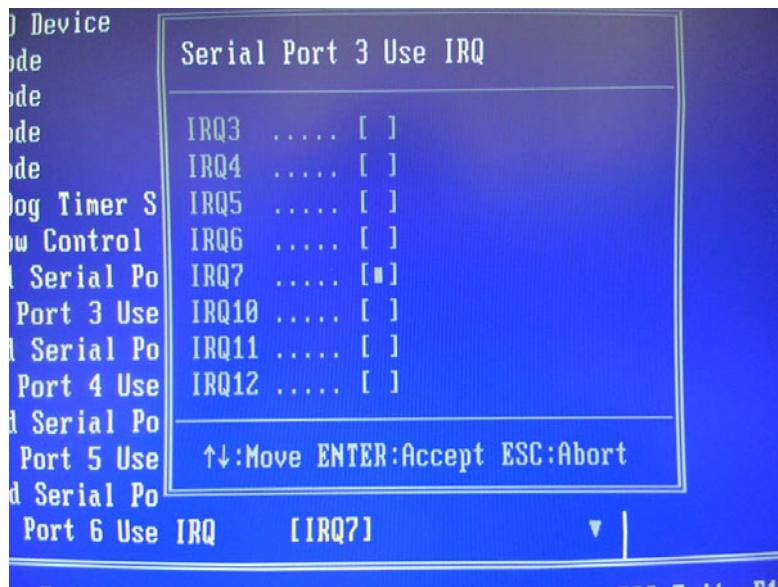


Figure 4.15: Serial Port 3 Use IRQ

4.7 Power Management Setup

The power management setup controls the CPU card's "green" features to save power. The following screen shows the manufacturer's defaults:

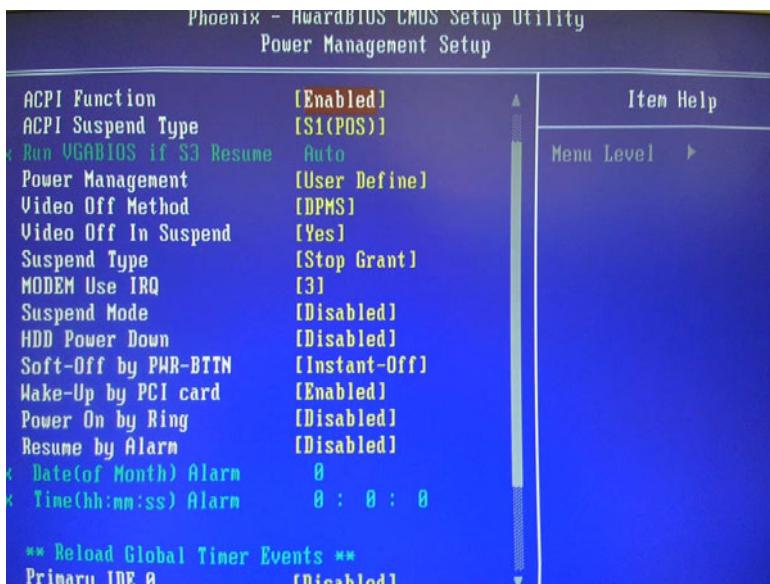


Figure 4.16: Power management setup screen

4.7.1 ACPI function

The choice: Enabled, Disabled.

4.7.2 ACPI Suspend Type

This field is used to select the type of Suspend mode. The setup options are:

S1 (POS)	Enables the Power On Suspend function
S3 (STR)	Enables the Suspend to RAM function
S1 & S3	Enables both the Power On Suspend function and Suspend to RAM function

4.7.3 Run VGABIOS if S3 Resume

When this field is set to Auto, the system will initialize the VGA BIOS when it wakes up from the S3 state. This can be configured only if the “ACPI Suspend Type” field is set to “S3 (STR)” or “S1 & S3”. The setup options are “Auto”, “Yes”, and “No”. The default setup value is “Auto”.

4.7.4 Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

- HDD Power Down
- Suspend Mode

There are four selections for Power Management, three of which have fixed mode settings.

Min. Power Saving	Minimum power management., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max. Power Saving	Maximum power management., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined (Default)	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disableable.

4.7.5 Video Off in Suspend

When system is in suspend mode, the video will turn off. The Options are “Blank Screen”, “V/H SYNC+Blank”, or “DPMS”. The default value is “DPMS”.

4.7.6 Video Off in Suspend

This field is used to disable video when the system enters Suspend mode.

4.7.7 Suspend Type

The options are “Stop Grant” and “PwrOn Suspend”.

4.7.8 Modem Use IRQ

This determines the IRQ that the MODEM can use. The setup options are: “3”, “4”, “5”, “7”, “9”, “10”, “11”, “NA”. The default setup value is “3”.

4.7.9 Suspend Mode

When the system enters the Suspend mode, the CPU and onboard peripherals will be shut off. When enabled, and after the set time of system inactivity, all devices except the CPU will be shut off.

4.7.10 HDD Power Down

You can choose to turn the HDD off after one of the time intervals listed, or when the system is in “suspend” mode. If the HDD is in a power saving mode, any access to it will wake it up.

4.7.11 Soft-Off by PWR-BTTN

If you choose “**Instant-Off**”, then pushing the ATX soft power switch button once will switch the system to “system off” power mode. You can choose “**Delay 4 sec.**” If you do, then pushing the button for more than 4 seconds will turn off the system, whereas pushing the button momentarily (for less than 4 seconds) will switch the system to “suspend” mode.

4.7.12 Wake-Up by PCI card

Enabled	This field should be set to Enabled only if your PCI card uses the PCI PME (Power Management Event) signal to remotely wake up the system. Access to the LAN card or PCI card will cause the system to wake up. Refer to the card's documentation for more information.
Disabled	The system will not wake up despite access to the PCI card

4.7.13 Power On By Ring

Set this field to Enabled to use the modem ring-on function. This will allow your system to power-on and respond to calls coming from an external modem.

4.7.14 Resume By Alarm

When Enabled, you can set the date and time at which the RTC (real time clock) alarm awakens the system from Suspend mode. The choices: Enabled, Disabled.

Enabled	When Enabled, you can set the date and time you would like the Soft Power Down (Soft-Off) PC to power-on in the “Date (of Month) Alarm” and “Time (hh:mm:ss) Alarm” fields. However, if the system is being accessed by incoming calls or the network (Resume On Ring/LAN) prior to the date and time set in these fields, the system will give priority to the incoming calls or network.
Disabled	Disabled Disables the automatic power-on function. (default)

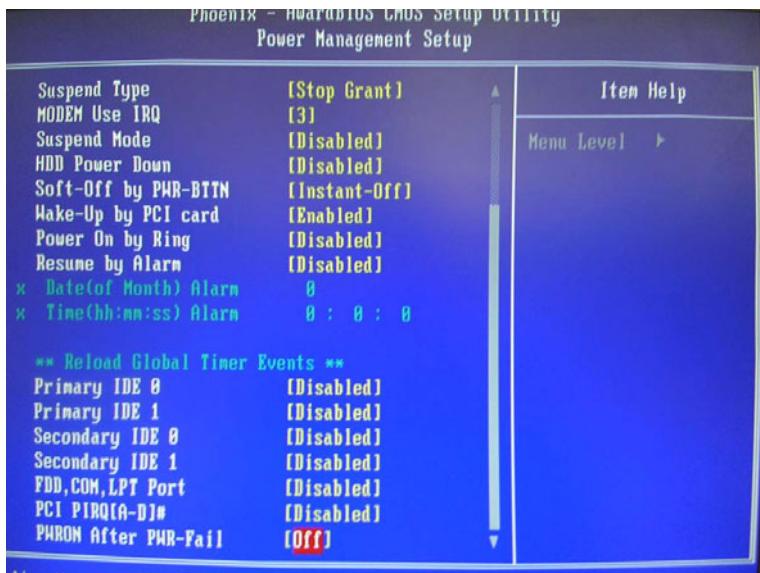


Figure 4.17: Power Management Setup

4.7.15 Date (of Month) Alarm

0	The system will power-on everyday according to the time set in the “Time (hh:mm:ss) Alarm” field.
1-31	1-31 Select a date you would like the system to power-on. The system will power-on on the set date, and time set in the “Time (hh:mm:ss) Alarm” field.

4.7.16 Time (hh:mm:ss) Alarm

This is used to set the time you would like the system to power-on. If you want the system to power-on everyday as set in the “Date (of Month) Alarm” field, the time set in this field must be later than the time of the RTC set in the Standard CMOS Features submenu.

4.7.17 Primary IDE 0 / 1 and Secondary IDE 0 / 1

When Enabled, the system will resume from suspend mode if Primary IDE 0 / 1 or Secondary IDE 0 / 1 is active. The choice: Enabled, Disabled.

4.7.18 FDD, COM, LPT PORT

When Enabled, the system will resume from suspend mode if FDD, COM port, or LPT port is active. The choice: Enabled, Disabled.

4.7.19 PCI PIRQ [A-D]#

When Enabled, the system will resume from suspend mode if an interrupt occurs. The choice: **Enabled**, **Disabled**.

4.7.20 PWRON After PWR-Fail

Off	When power returns after an AC power failure, the system's power is off. You must press the Power button to power-on the system.
On	When power returns after an AC power failure, the system will automatically power-on.
Former-Sts	When power returns after an AC power failure, the system will return to the state where you left off before power failure occurs. If the system's power is off when AC power failure occurs, it will remain off when power returns. If the system's power is on when AC power failure occurs, the system will power on when power returns.

4.8 PnP/PCI Configurations

This section shows how to configure the PCI bus system. It covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

4.8.1 Reset Configuration Data

Default is **Disable**. Select **Enable** to reset Extended System Configuration Data (ESCD) if you have installed a new add-on and system configuration has caused a conflict that prevents the OS from booting.

Enabled	The BIOS will reset the Extended System Configuration Data (ESCD) once automatically. It will then recreate a new set of configuration data.
Disabled	The BIOS will not reset the configuration data.

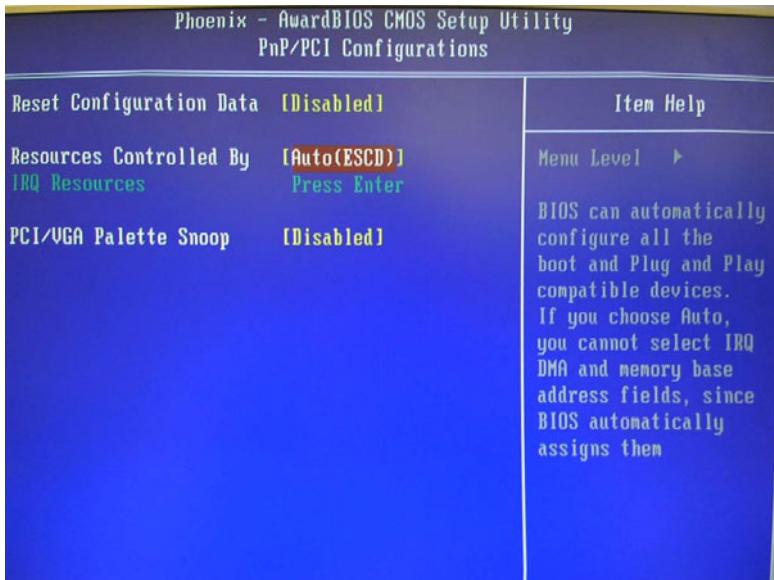


Figure 4.18: PnP/PCI configurations screen

4.8.2 Resources controlled by

The Award Plug and Play BIOS has the capability to automatically configure all of the boot and Plug & Play compatible devices.

Auto(ESCD)	The system will automatically detect the settings for you.
Manual	Choose the specific IRQ resources in the “IRQ Resources” field.

4.8.3 IRQ Resources

Move the cursor to this field and press <Enter>. The “IRQ-3” to “IRQ-15” fields will appear. Set each system interrupt to either PCI Device or Reserved.

4.8.4 PCI/VGA Palette Snoop

This field determines whether the MPEG ISA/VESA VGA cards can work with PCI/VGA or not. The default value is Disabled.

Enabled	MPEG ISA / VESA VGA cards work with PCI / VGA.
Disabled	MPEG ISA / VESA VGA cards do not work with PCI / VGA.

4.9 Frequency/Voltage Control

This section shows the user how to configure the processor frequency.

4.9.1 Auto Detect PCI CLK

This field enables or disables the auto detection of the PCI clock.

4.9.2 Spread Spectrum

This field sets the value of the spread spectrum. The default setting is **Disabled**. Leave this field in its default setting. Do not alter this setting unless advised by an engineer or technician.

4.9.3 CPU Host / 3V66 / PCI Clock

Leave this field in its default setting. Do not alter this setting unless advised by an engineer or technician.

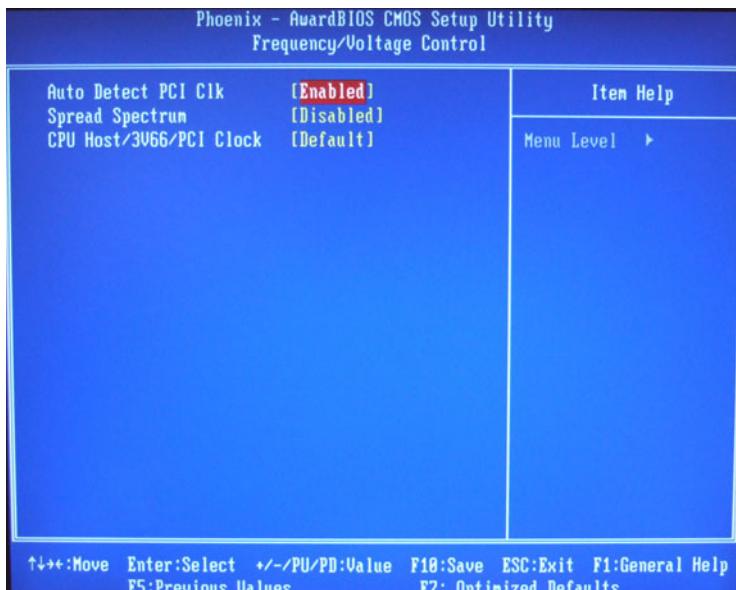


Figure 4.19: Frequency/Voltage Control

4.10 Load Optimized Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

4.11 Set Password

To change the password:

1. Choose the “Set Password” option from the “Initial Setup Screen” menu and press <Enter>. The screen will display the following message:

Please Enter Your Password

Press <Enter>.

2. If the CMOS is good or if this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen will display the following message:

Please Confirm Your Password

Enter the current password and press <Enter>.

3. After pressing <Enter> (ROM password) or the current password (user-defined), you can change the password stored in the CMOS. The password must be no longer than eight (8) characters. Remember, to enable the password setting feature, you must first select either “Setup” or “System” from the “Advanced BIOS Features” menu.

4.12 Save & Exit Setup

If you select this and press <Enter>, the values entered in the setup utilities will be recorded in the CMOS memory of the chipset. The microprocessor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

4.13 Exit Without Saving

Selecting this option and pressing <Enter> lets you exit the setup program without recording any new values or changing old ones.

2

CHAPTER **5**

PCI SVGA/LCD Setup

This chapter details the software configuration information. It shows you how to configure the card to match your application requirements. The AWARD System BIOS is covered in Chapter 4.

Sections include:

- Installation of SVGA drivers
 - for Windows 98/ME
 - for Windows 2000/XP

Chapter 5 PCI SVGA/LCD Setup

5.1 Introduction

The board has an onboard Intel 852GM or 855GME chipset for its AGP/SVGA controller. It supports LVDS LCD displays and conventional analog CRT monitors with 64 MB frame buffer shared with system memory. The VGA controller can drive CRT displays with resolutions up to 1600 x 1200 @ 85 Hz and 2048 x 536 @ 75 Hz and 2-channel LVDS displays up to UXGA panel resolution at frequencies from 25 MHz to 112 MHz.

5.1.1 CMOS setting for panel type

The ARK-3381 system BIOS and custom drivers are located in a 512 KB, Flash ROM device, designated U29 on the system motherboard of ARK-3381. A single Flash chip holds the system BIOS, VGA BIOS and network Boot ROM image. The display can be configured via CMOS settings. This method Choice of “Boot display” selection items of Advanced Chipset Features sections of Award BIOS Setup.

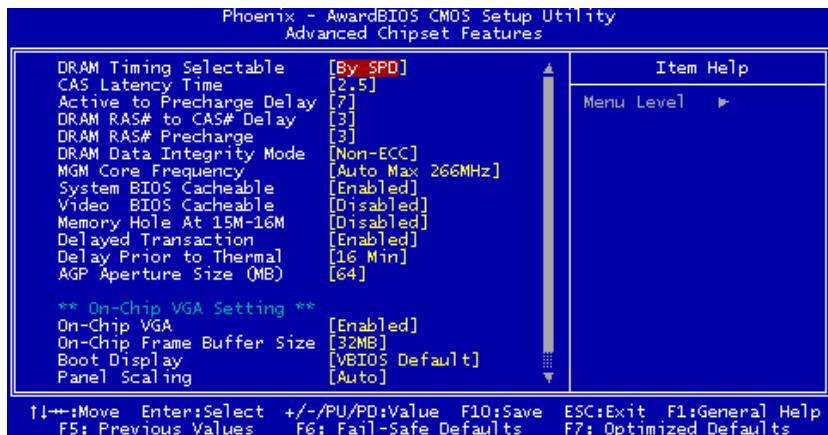


Figure 5.1: Advanced Chipset features screen

5.1.2 Display type

The ARK-3381 can be set in one of five configurations: on a CRT, on an LVDS based flat panel display, on a DVI based digital flat panel display, on a TV display, or on both dual independent displays. The system is initially set to “Auto”.

5.1.3 Dual Independent Display

The ARK-3381 uses an Intel 855GME or Intel 852GM controller that is capable of providing multiple views and simultaneous displays with mixed video and graphics on a flat panel and CRT. To set up dual display under Windows 98, Windows NT/2000/XP follow these steps:

1. Select “Start”, “Control panel”, “Setting”, “Advanced”, “Graphics Properties”, “Device”.

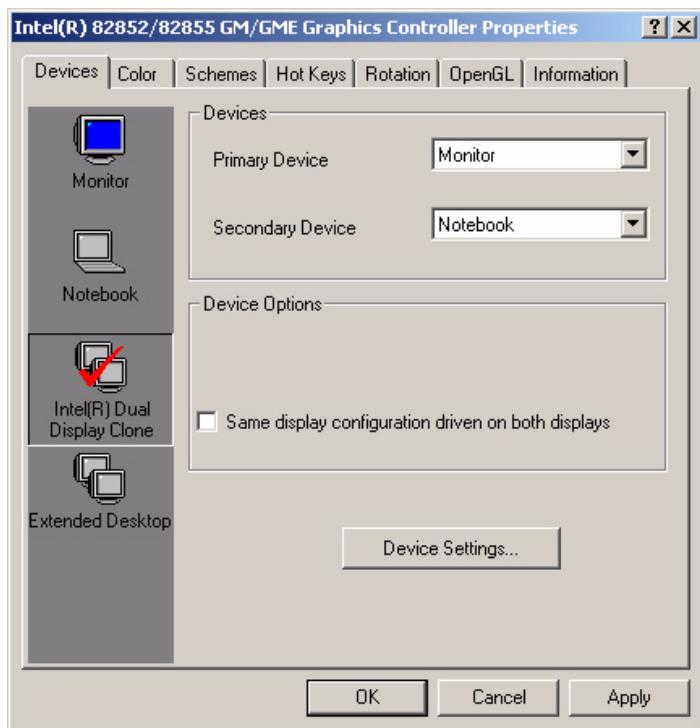


Figure 5.2: Graphics Controller Properties - Devices

2. Select “1” for current display, or “2” for second display.

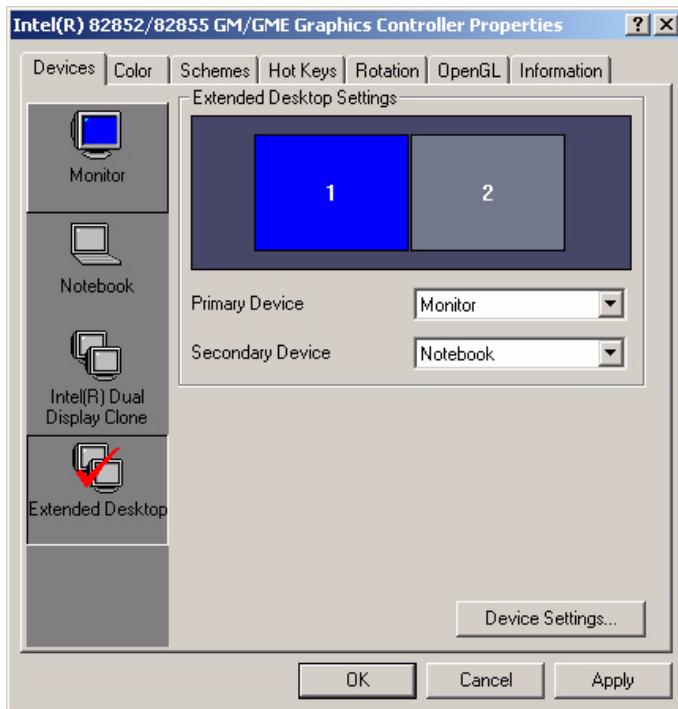


Figure 5.3: Extended Desktop Settings

3. Enable "Extend my Windows desktop onto this monitor".
4. Click "OK".

5.2 Installation of the SVGA Driver

Follow the steps for your operating system to install the SVGA driver.

5.2.1 Installation of Windows 98/Me

You can find the Win98/Me VGA driver on the ARK-3381 CD, in the following directory: VGA\Win9x_ME\Graphics\Setup.

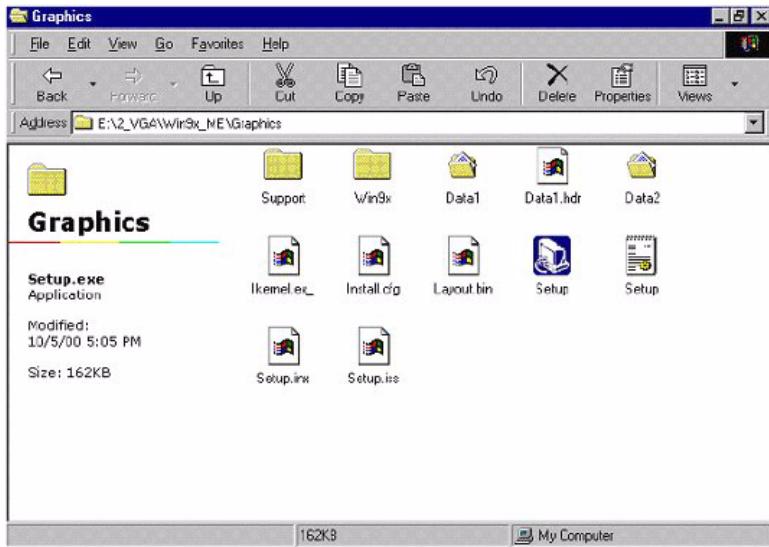


Figure 5.4: Directory "Graphics"

Notes: 1. The windows illustrations in this chapter are intended as examples only. Please follow the listed steps, and pay attention to the instructions which appear on your screen. For convenience, the CD-ROM drive is designated as "D" throughout this chapter.

5.2.2 Installation of Windows 2000/XP

You can find the Win2000/XP VGA driver on the ARK-3381 CD-ROM, in the following directory: \VGA\win2k_xp1332.

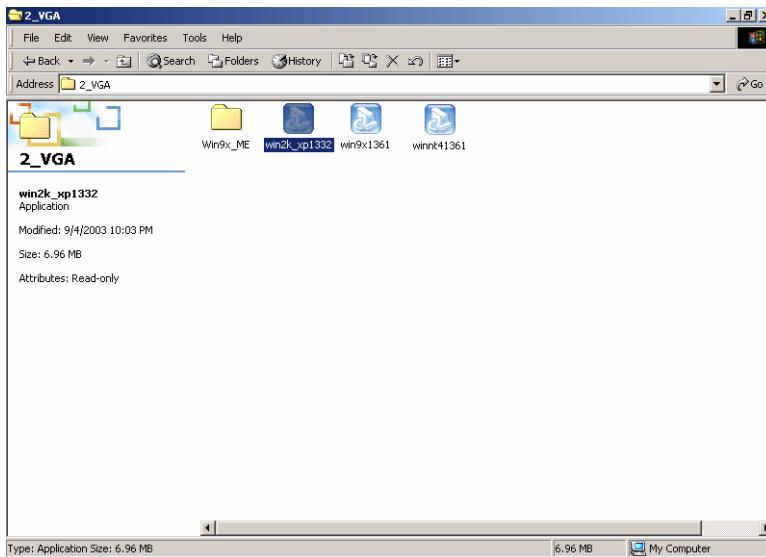


Figure 5.5: CD Directory “VGA”

Double click “setup” and then “next” in the setup wizard.

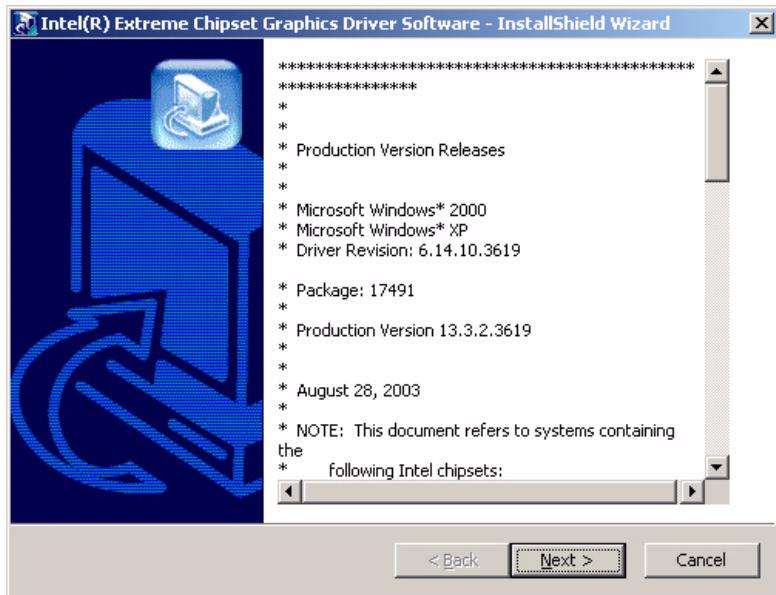


Figure 5.6: Driver Software Install Wizard

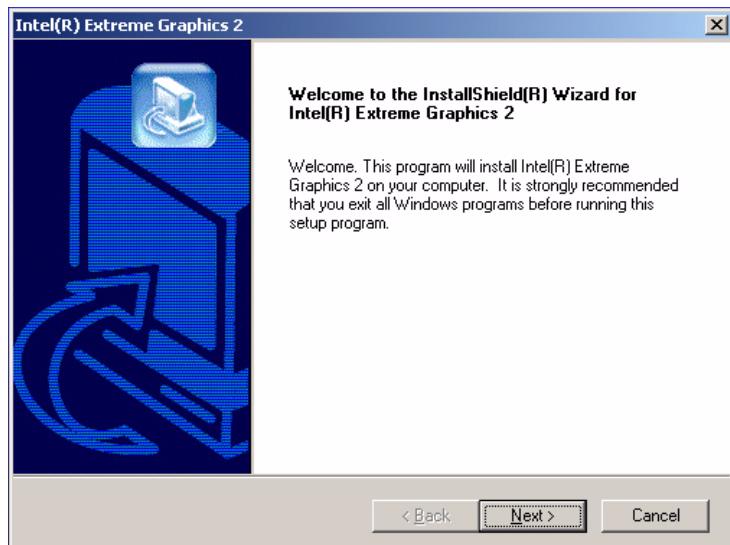


Figure 5.7: Graphics Driver Setup

Restart the computer when installation has finished.

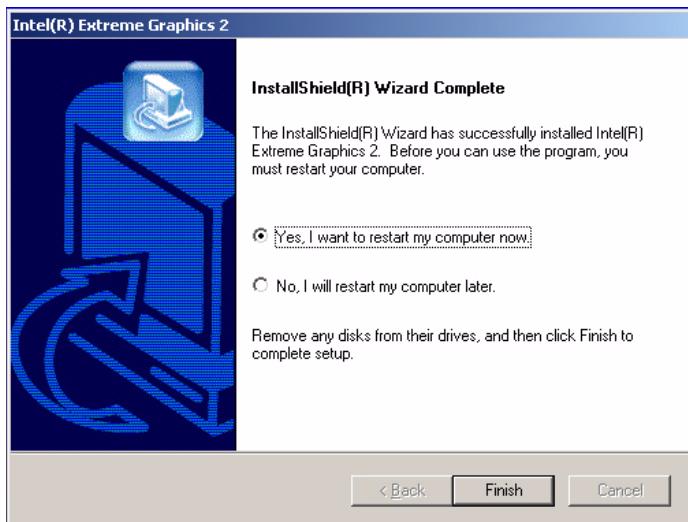


Figure 5.8: InstallShield® Wizard Complete

CHAPTER

6

Full Disassembly Procedure

This chapter details the system disassembling procedure for setting up the jumpers and for maintenance.

Chapter 6 Full Disassembly Procedure

6.1 Introduction

If you want to completely disassemble the Embedded Box Computer, follow the step-by-step procedures below. Users should be aware that Advantech Co., Ltd. takes no responsibility whatsoever for any problems or damage caused by the user disassembly of the embedded box computer. Make sure the power cord of the embedded box computer is unplugged before you start disassembly. The following procedures do not include the detailed disassembly procedures for the HDD, CompactFlash Disk and SRAM; all of which can be found in Chapter 3.

1. Unscrew the 2 screws on the bottom side.

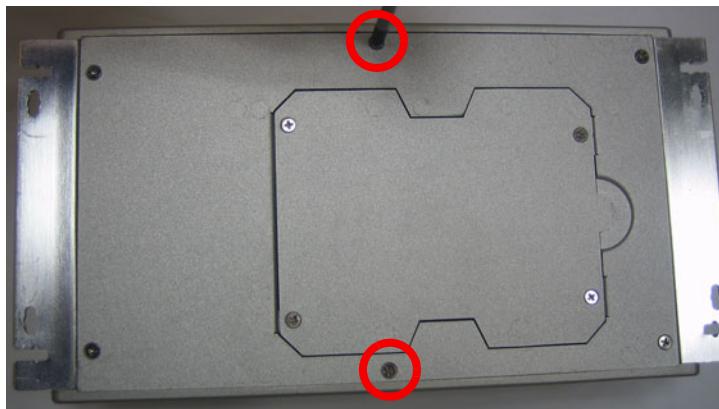


Figure 6.1:

2. Unscrew the screws on the frame bracket of the front side of the system.



Figure 6.2:

3. Remove the front frame bracket by carefully pulling and lifting the bracket.



Figure 6.3:



Figure 6.4: The Front Frame Bracket removed

4. Unscrew the 2 screws on the Front Metal Face plate and unscrew the 4 hexagonal bolts on the Printer1 and Printer2 connectors



Figure 6.5:



Figure 6.6: The Front Metal Face Plate removed.

Warning: Do not use too much pressure when removing the front metal face plate as the power button cable is still attached and could be damaged.

5. Unscrew the 4 screws of the frame bracket on the rear side of the system.



Figure 6.7:

6. Remove the rear frame bracket by carefully pulling and lifting the bracket.

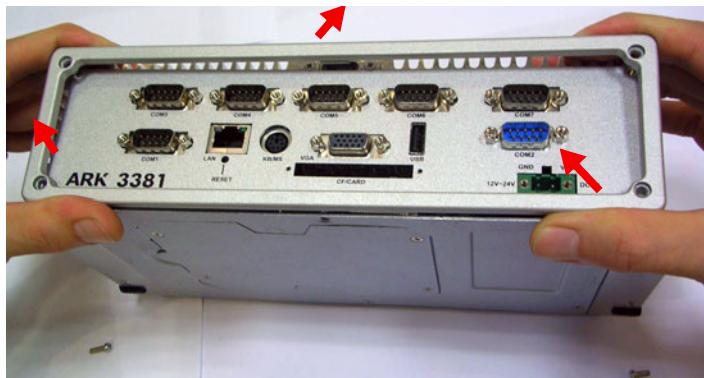


Figure 6.8:

7. Unscrew the 2 screws on the rear metal face plate.



Figure 6.9:

8. Unscrew the 2 hexagonal bolts that fix the “COM2 port” on the Rear Metal Face Plate.



Figure 6.10:

Warning: Do not use too much pressure when removing the front metal face plate as the COM2 connector cable is still attached and could be damaged.



Figure 6.11: The Rear Metal Face Plate Removed

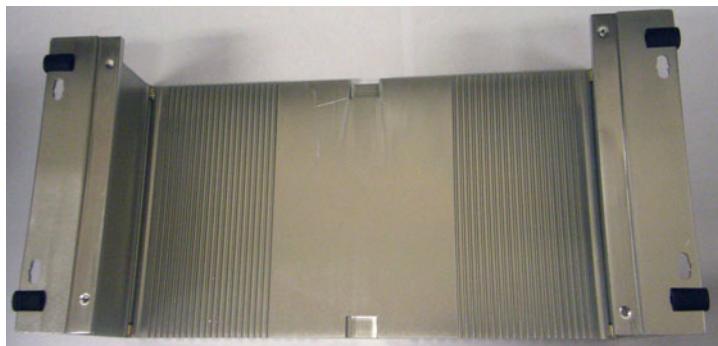


Figure 6.12: The system after the top cover has been removed

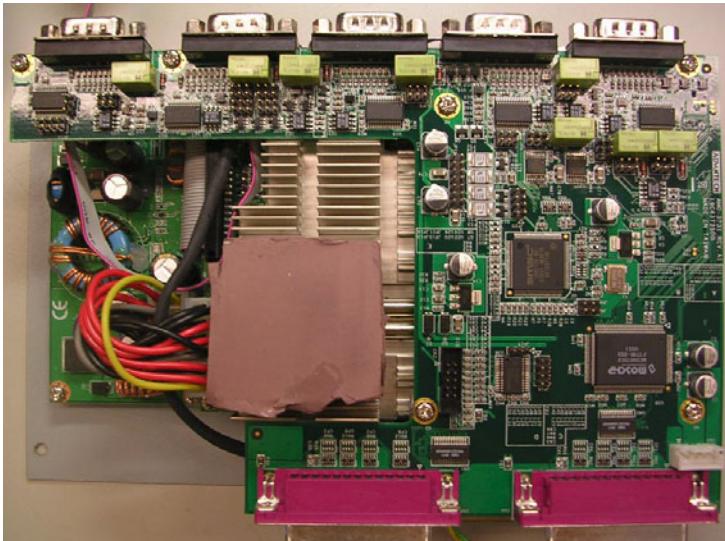


Figure 6.13:

9. Unscrew the 6 screws which fix the AMO-3731 Module I/O board to the system board.

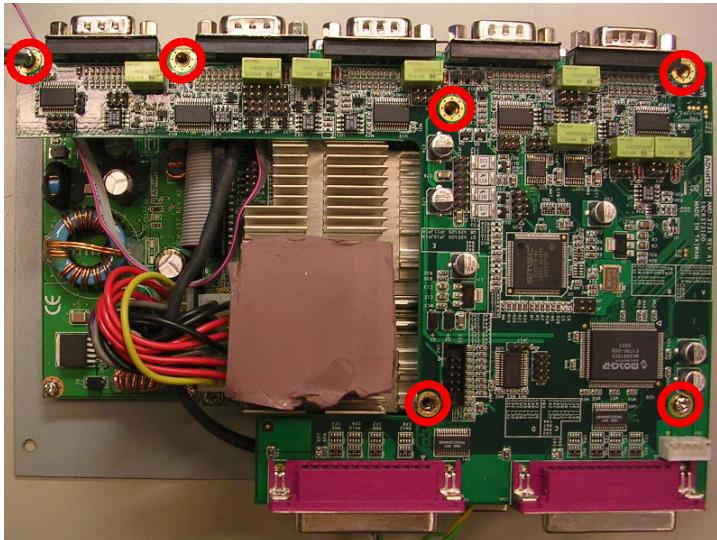


Figure 6.14:

10. Remove AMO-3731 Module I/O board from MIO Socket of the system board



Figure 6.15:

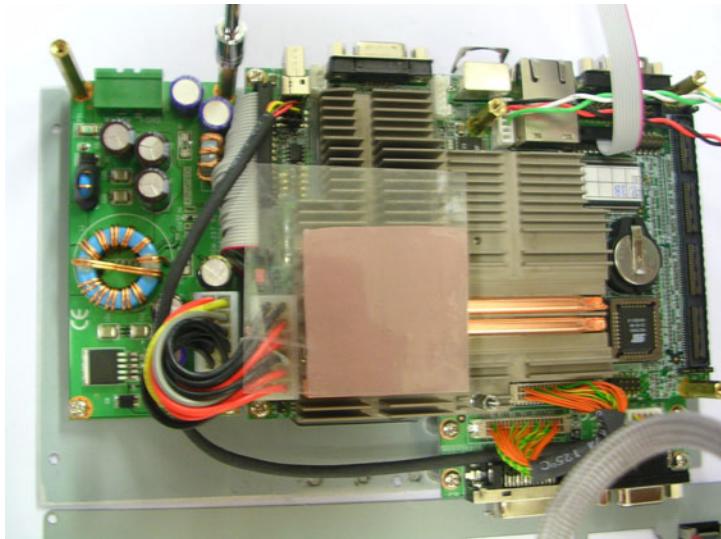


Figure 6.16: The System with the AMO-3731 Module I/O board removed

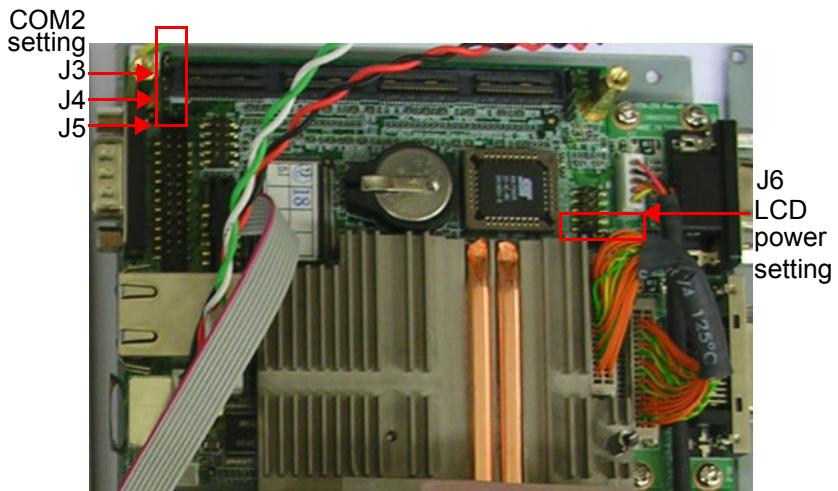


Figure 6.17: Jumper Location on PCM-9380/PCM-9386 Motherboard

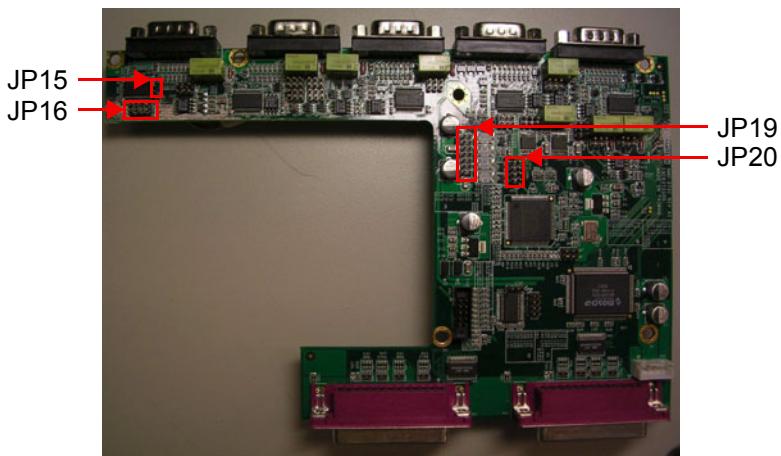


Figure 6.18: The Jumper Setting Location of AMO-3731 Module I/O board